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£2,000 reward for stolen micro system

OVER £20,000 worth of computer equipment was taken by thieves who apparently knew what they were after when they broke into the central research establishment of Tube Investments, the engineering and domestic appliance group, at Hinxton Hall, Cambridgeshire.

The company is offering a £2,000 reward.

The equipment, which was taken some time between Friday, January 19 and Monday, January 22, from a ground floor laboratory, consisted of a complete Intel Model 231 Intellec Series II development system with almost all its peripherals.

One theory the police are investigating is that the thieves had a "shopping list" and had been instructed what to take. However, the printer was overlooked and an older Intellec 4/Mod 40 was taken by mistake. In the same room as the Intellec there is other valuable equipment including a Digital Equipment PDP-11.

Anyone with information that may help the police is asked to contact Det Sgt R Miller at Parkside Police Station, Cambridge. Tel: 0223 58966.

The equipment stolen includes the Model 231 Intellec, Serial No DG 1247; floppy disc drive, No CS 954; universal prom programmer, No DN 1206; an emulator ICE 80, No AY 3930; diskette storage file, No 3401 590 01; and an Intellec 4/Mod 40 development system.

NEWS IN BRIEF

Phone of the future

STANDARD stored program control internal telephone facilities such as automatic transfer of incoming calls to another extension, call break-in facility, automatic recall of frequently used numbers and conference calls, will be available to a much wider range of UK users next year.

A new microprocessor-based PABX taking up to 10 lines and serving up to 30 extensions has been developed for the Post Office by Pye TMC at Malmesbury, and a production order worth £10 million for the system, called SBS, has been placed. SBS will be available from the Post Office next year.

Access peace

AN interim payment of 10% with the promise of more following a Central Arbitration Committee ruling in favour of National Union of Bank Employees computer staff has ended the prospect of strike action at the Access joint credit card company (CW, January 25). Increases will be backdated to July 1, 1978.

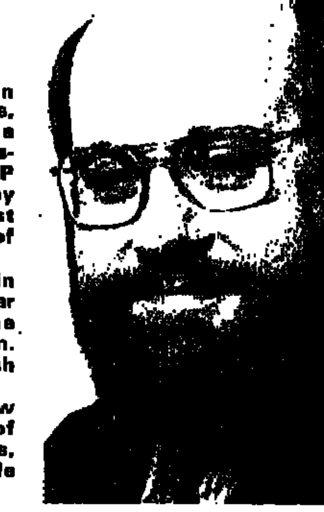
Job study

A STUDY of opportunities for disabled people in computing is being carried out by the National Computing Centre, in co-operation with the BCS Disabled Group and the Manpower Services Commission. Guidelines are to be produced on the employment of the disabled, and the NCC would like to hear from DP departments where disabled people are employed.

Itel sales up 71%

ITEL financial results for 1978 include sales of nearly $689 million, a 71% increase on 1977. The increase is attributed partly to the Advanced System series of IBM compatible computers, but also to leased transportation equipment which accounted for $925 million of Itel's $1.3 million total assets by the end of 1978. Itel's net profits increased by 54% to over $47 million.

Ockenden heads new CAP-CPP company



HIVING-OFF its activities in scientific and real time systems, the CAP-CPP group has formed a new company to operate exclusively in these areas. Called CAP Scientific Ltd, it will be headed by John Ockenden, until last November managing director of Scicon Consultancy.

Ockenden is well known in European computing and last year was elected president of the Computing Services Association. He is also a Fellow of the British Computer Society.

He will be assisted in the new venture by Mick Lacey, one of CAP UK's most senior managers, who was previously responsible for client support services.

Call for a European legal right to know

THE Council of Europe Parliamentary Assembly has unanimously passed a recommendation that all member countries should enact freedom of information laws, giving citizens a right of access to government documents, with a right of appeal to the courts.

The recommendation now goes to the committee of foreign ministers of the member states, where supporters are confident it will be passed in early April.

The Council of Europe's resolutions do not have any legal force, but they can bring moral pressure to bear on member governments. The Parliamentary Assembly is largely composed of backbench MPs from member countries, with whom freedom of information is a "pet subject."

The recommendation was put forward by UK Labour MP Arthur Lewis (Newham NW) who is one of the supporters of Clement Freud's Bill currently being considered by a Commons committee (see page 15).

Other recommendations were also passed asking the 22 member governments to ensure citizens have a legal right to privacy with respect to government files, and a right to inspect and correct records.

The Assembly also instructed its rules committee to find ways of making its own information more readily available to the public.

Willibald Pahr, the Austrian Foreign Minister, made a speech to the Assembly endorsing the recommendations and urging the members to be "the conscience of European democracy" by guaranteeing citizens their legal right to know.

DAP 'four times as powerful' for Met Office bid

ICL will build a Distributed Array Processor four times as powerful as the machine it announced last year if it wins the contract expected to be placed before the end of the year by the Meteorological Office for a machine to handle long-term weather forecasting (CW, February 1).

ICL is competing for the contract with Control Data, Cray and Burroughs which are bidding with the Cyber 203, the Cray 1 and the Burroughs Scientific Processor, respectively.

The Met Office believes that a DAP with 64 x 64 processor elements, like the model soon to be supplied by ICL to Queen Mary College in London, would not be powerful enough for the long-term forecasting work because this will involve very complex climate simulations.

ICL says that it originally proposed a 64 x 64 element DAP to the Met Office but that the tender it will place later this year will almost certainly involve a 128 x 128 machine. This could not be delivered until 1982, but ICL would be prepared to supply a 64 x 64 DAP for the Met Office to use until then.

An ICL spokesman pointed out that NASA in the US had been interested in a 128 x 128 DAP for satellite image processing, but that talks between ICL and NASA could not develop further for mainly political reasons. The contract for an image processor went instead to the US-based firm, Goodyear, which is building a 128 x 128 machine called the Massively Parallel Processor (CW, January 18).

Long-term forecasts

THE Meteorological Office hopes that long-term weather forecasting will be a major part of its contribution to the World Meteorological Organisation's world climate programme. The Met Office's work in this area would complement the operations of the European Centre for Medium Range Weather Forecasting, ECMWF, at Shinfield Park, near Reading, which makes forecasts of up to 10 days ahead using a Cray 1A (CW, October 19, 1978).

The Met Office's existing big machine at its Bracknell computer centre is an IBM 360/195 which can handle short-term forecasts of up to five days. But the 195 is drastically underpowered for handling long term forecasting covering periods of up to a year.

Neddy calls for 'more positive approach' to micros

"THE National Economic Development Council should establish a programme to involve other Sector Working Parties in exploring the use of microelectronics." This is one of the main recommendations of the Neddy Component Sector Working Party, in its 1979 progress report.

This would form the basis of what the SWP calls a much more positive approach needed by government in the future.

In particular, it feels 'the government must meet the growing fears among trade unionists that microelectronics will cause large-scale unemployment, and it points to a need for much greater dissemination of information to interested parties.

The SWP says it will be vital for the Central Policy Review Staff to publish all its reports on the subject, as a contribution to open discussion of issues.

The progress report also calls for a government initiative to overcome the problems of industry obtaining skilled staff. This is tied directly to industry's inability to pay high enough salaries.

GEC wins £10m viewdata business

IN the 10 months since April GEC Computers has taken orders worth £10 million for GEC 4000 series minicomputers for use with Post Office viewdata software. The figure includes £2.5 million of business from abroad, and despite suggestions to the contrary (CW, January 25), the company has not ruled out the possibility of winning viewdata-related sales in the US.

The disadvantage of the GEC mini from the point of view of potential US customers is that GEC at present has no support network in the US, and users have indicated that support might be difficult. However, once the proposed GEC acquisition of office equipment manufacturer A. B. Dick of Chicago is complete, GEC will have a US-wide network of offices which would greatly ease the problem.

Latest overseas orders come from Switzerland where the Post Office has sold its rights to the Swiss PTT, which in turn has subcontracted subsidiary STR AG of Zurich as project manager for a system giving information in French and German. Switzerland is the third European country to opt for the system.

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Euro network to combat terrorism

THE Parliamentary Assembly of the Council of Europe is backing a plan to set up a Europe-wide computer network to combat terrorism. This would probably consist of terminal links to the West German federal police machine at Wiesbaden, which is already being used to hold information on terrorists, as well as on around ten million other criminals.

The idea for a network was put forward in a report on terrorism by the Assembly's political affairs committee. It was presented in general terms without going into detail on how it would actually work.

Now that the Assembly has passed a resolution approving it, individual governments will start to work on the technical aspects.

The political affairs committee thinks the system is necessary to help eliminate overlapping of national intelligence services. It could even help foil attacks before they took place, the committee said.

Briefing

No cut in Talisman costs

PROTESTS from Stock Exchange members about charges for Talisman have been met by the Stock Exchange chairman, Nicholas Goodison, with an undertaking that the general service charge will be reduced if Talisman proves cheaper to run than expected.

The general service charge pays for the general running of the Exchange and has been used to finance much of the development of Talisman. It is calculated quarterly in arrears and can easily be increased or reduced as conditions demand. However, the Talisman tariff is not to be changed for some time.

Its most unpopular feature appears to be the charges for medium sized bargains in the £5,000 to £10,000 areas which are nearly twice as high as originally expected.

Strike goes ahead

GIVEN no assurances in a meeting with Lord Peart, the Lord Privy Seal, that the government would incorporate the findings of the independent Pay Research Unit in any wage negotiations (CW, February 8), the Society of Civil and Public Servants and the Civil and Public Servants Association, say that their proposed strike action on February 23 is still on.

Olympic Univac

DESPITE President Carter's veto on the sale of a Univac 1100 to the Soviet Union (CW, July 20, 1978), Univac still hopes to get the business. It is putting together proposals for a smaller machine which it hopes to have approved in time for the 1980 Olympics. The Russians want the computer to provide message switching services for journalists covering the Moscow Games.

Prices down

INTEL has reduced the prices of the 5-MHz and 4-MHz versions of its 16-bit 8086 microprocessor by 23% and 21% respectively. The price for the 5-MHz 8086 in quantities of 500 to 999 is $76.25, while the 4-MHz version costs $65.20. Intel says that the reductions are part of its planned 8086 marketing strategy.

Eight-page memory

DIGICO has enhanced its Regent VDU with an optional eight-page memory feature. It adds £350 to the £1,050 price of the standard Regent which can store two pages.

£2m for micros

OVER 200 applications for assistance are being considered under Part C of the Microprocessor Applications Project, and 33 have so far been approved. These figures were given in a Commons answer by Leslie Huckfield, Industry Parliamentary Under Secretary. This represents a financial commitment of about £2 million, although no money has yet been spent.

The mysteries of printed circuit board design and production were explained to Princess Margaret during a tour of Jasmin Electronics plant when she visited Leicester last week. Here Peter Smith, of the inspection department, shows the Princess some of the test procedures. On the left is Sam Rhys-Williams, sales director. Other Jasmin products on display included a Heathrow teletext information system, and a viewdata editing terminal, designed for offline editing by companies and organisations providing viewdata information.

No computer men in China delegation

THE UK looks likely to be an "also ran" in the race to sell high technology to China, while France, the US and Japan pick up the lion's share of the business.

Delegations from the UK and France will visit China this month. While France is cementing its concordat with China on computers (CW, December 21, 1978) with representatives from most of her leading companies (see page 20) the UK delegation has no computer representative.

Instead the delegation, led by Industry Minister Eric Varley, is made up mainly of representatives of declining industries such as shipbuilding and steel. Heavy engineering is represented by GEC, Davy International, Acrow and John Brown Engineering Group. The delegation is completed by representatives of the Coal Board, British Aerospace, Rolls Royce, Rolls Royce Motors and the Electrical, Electronic, Telecommunication and Plumbing Union.

The Department of Industry told Computer Weekly that places on the trip were limited and that the organisations represented had contracts closer to conclusion than any DP company.

Strike cost

STRIKE action by Post Office computer staff (CW, February 1) seeking pay parity with white collar engineers in the corporation resulted in a loss of £3 million in revenue according to union sources, who added that this figure would have more than paid for their claim.

More City cash for the industry

AFTER a long spell in the wilderness following the Miles Roman and BCL crashes of the early 1970s, the computer industry is back in favour with City financial institutions. In the last six months, three merchant banks have made investments in companies in word processing, and indications from other merchant banks are that they would look very favourably on any sound proposals in the computer business.

On the software front, the Technical Development Capital arm of the Industrial and Commercial Finance Corp, owned by the major UK clearing banks, is playing a low-key role in helping to build UK and European software companies to a size where they can compete with the big US companies.

Much less publicised than the activities of the CAP's software company Insac, TDC has made investments in several UK software companies with a view to acting as marriage broker with small Continental companies.

"We have made investments in several software and services companies in the past six months, and now have holdings in six," a spokesman told Computer Weekly. "We are helping client companies that want to move into Europe, and we are also talking to the EEC about putting together big European software companies."

The merger between CRC of the UK and GSI of France was engineered by TDC, as was the acquisition by BOC of Software Sciences. TDC also has a substantial long-standing investment in UK minimaker CTL.

After Hambros' investment in

● Turn to page 2

ALL THE RULES

FULL details of rules and entry conditions for Computasters 79 are published on page 4. Already the teams are preparing for the contest. Don't miss your chance of taking part — closing date is March 10.

CII-HB in word processor deal

FRENCH computer manufacturer CII-Honeywell Bull is going into the office automation business with an initial deal with CPT of Minnesota, to market the US firm's Cassetyper and Disktype word processors in France on a non-exclusive basis.

In addition to a marketing organisation, CII-HB is setting up an R&D team of several dozen people to work on the design of products for the long-term future — 1985 onwards. There is expected to be close technical collaboration between the two firms.

CPT is introducing a new cheaper model of display word processor, the 6000, to include in the line CII-HB receives.

MP wants minister for micro revolution

A CABINET committee should be set up by the government, with an energetic minister in charge, to co-ordinate efforts to deal with the micro revolution. That is the view of Renee Short, Labour MP for Wolverhampton NE, who is worried that the govt is not taking seriously enough the problems posed, and that current activities by various departments are half-hearted.

Mrs Short is particularly concerned about the effects of micros on employment in the traditional industries in her area of the West Midlands, such as motor manufacturing, which has already been badly hit by overseas competition. Such competition can only be met, she says, by getting ahead now in new technology.

"We must see how we can use new techniques to create new jobs," she told Computer Weekly.

She has asked a large number of Parliamentary questions to find out what is going on in the Departments of Industry, Energy, Employment, and Education. Her conclusion is that a central driving force is needed, at Cabinet level, because effort needs to be stepped up and better co-ordinated.

In particular, Mrs Short thinks that much more resources need to be devoted to education, in equipping schools and training teachers. "If people are to use micros effectively in their work, as designers for example, we have to start teaching them in school," she said.

COMPUTER WEEKLY'S INSIDE NEWS

INTERNATIONAL SCENE

IBM sales in France have not been matching up to the value of the products the company builds there. This does not fit in with IBM policy and to balance things up, 4300 production has gone to Germany. Italy, too, may be hit by the move. This is reported in the International Section along with all the latest world news and regular features such as Marketview, Washington Report, US News, and a new column by leading American commentator Charles Lecht.

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GIANT KILLER?

The NEB is in giant-killing mode again and, after Inmos, which is challenging the big battalions in the microelectronics world, comes Nexos to take on the same role in the "office of tomorrow" stakes. Pat Coen of Logica VTS talks to Rory Johnston about the prospects of the venture.

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A technological platform for new companies

STRIKES, secondary picketing and the conversion of Leicester Square into a giant rubbish tip may dominate the news, but underlying our current concerns are other equally intractable problems which threaten our economic wellbeing and ultimately our way of life.

One of these which is particularly worrying, because it is an outward and visible sign of the structural weakness of the British economy, is the erosion of the industrial base on which, ultimately, all our fortunes depend.

Britain is, to an unacceptable degree, reliant upon the big battalions — the GECs, the ICIs, even the British Leylands of this world — to generate its wealth. Indeed, the degree of concentration is such that, in manufacturing industry, 100 firms control over 70% of output.

Over the last ten years the small business sector has been subjected to a process of attrition through takeovers, bankruptcies and a low level of activity in the formation of new businesses.

The withering away of the smaller business sector has been an important contributory factor to our poor industrial innovation record. Other countries such as the US, Japan, France and West Germany are proving more effective in bringing new processes into operation and new products into the marketplace even if, in some instances, they are spending less on R&D than we in Britain.

The nature of this unhappy situation and some of the reasons for it are examined in a report, Industrial Innovation,* from the Advisory Council for Applied Research and Development, which sets out the forms that industrial innovation may take and identifies some of the reasons for our poor performance.

In a paper submitted to the Wilson Committee on the workings of the City, quoted in the ACARD report, the Institutionalisation of our society is seen as one of the main causes of the stifling of new companies and new ideas.

This process has put investment decisions into fewer and fewer hands with a consequent increase in the risk with which each decision-maker is faced. Linked with this is the fact that those in financial institutions who are making investment decisions lack any intuitive sense of the kind of new business which might succeed.

Finally, and perhaps most significantly, financial backing for individual innovators has virtually disappeared in Britain, despite the fact that almost every successful innovation from zip fasteners to xerography has initially been the work of a single man.

The outlook seems bleak, but the means of breaking out of this spiral down to tenth class power status could be at hand.

Without descending to Mr Callaghan's euphoria which sees Britain as the "Silicon Valley" of Europe, it is at least arguable that microelectronics in general and the microprocessor in particular, could widen our industrial base and encourage innovation by providing the technological platform on which new companies could base their business.

However, such new technology based firms will only be set up if conditions are favourable. The ACARD report identifies some of the factors which have favoured their creation in the US and high among these is beneficial tax regulations which would allow sufficient reward for investments, recognising the high risk of technological enterprise.

That is the easy part. Also necessary is an attitude in society which encourages entrepreneurship and improved methods of making finance available to new enterprises.

The government has shown that it is aware of these facts and that it appreciates the importance of microelectronics. What it must now demonstrate is that it is equally aware of the importance of the investor and the entrepreneur if we are again to achieve a reasonable level of industrial innovation in Britain.

* Industrial Innovation is published for the Cabinet Office by HMSO, £1.

More cash for the industry

From front page

Microwriter (CW, June 15, 1978) and Keyser Ullman in MDS Rentals (CW, September 28, 1978), merchant bank Kleinwort Benson has put £250,000 into Data Recall.

The investment buys 25.1% of the voting, giving the bank a blocking minority holding in Data Recall, which is doing dramatic business with the Diamond word processing system.

The introduction came about quite by chance, when Data Recall founder and chairman Eric Jones had dealings with Kleinwort Benson on another matter and happened to send a former colleague at the bank a copy of his company's accounts.

A director was sent to look at Data Recall and the investment followed. The attractions are not hard to see. "We have 75% of the screen-based word processing systems in UK government departments, and 50% of the dictating machines we are shipping this month will go for export," Jones told Computer Weekly.

"We did £1.25 million of business last year, and expect to reach £3 million this year."

FOCUS

Motivating the DP team

MOTIVATION, we are frequently told, is the key to all DP problems. Unfortunately it takes more than a motivation key to turn on the average DP professional.

Just what motivates the DP team is far from clear. Certainly current salary levels are seldom the main criterion. Neither are such motivational factors as responsibility, working conditions or job security. Key points are more likely to include career opportunities, job satisfaction and performance.

As a result, DPMs face a confusing and difficult motivation course. This is especially true in the case of the well paid DP analyst. Motivation in this area is less likely to be financial as general purpose. The dangling carrot could be a promise by the DPM for a place on the next available communication workshop, a visit to a European subsidiary or an invitation to the forthcoming user group rave-up.

Programmer motivation is equally diffuse. Incentives are most likely to be the promise of relief from patching and maintenance to that of an assurance of close involvement in the next new application project.

Motivating the operation team likewise calls for a degree of subtlety. That additional workload is best achieved by a combination of guile and cunning. Bribes are definitely not the solution. The correct action will be amending shift or rota timings, arranging late transport home, approving an article in Bernard Allen's Computer Weekly Op Spot page or resiting the installation coffee machine.

Only in the case of data prep does basic motivation feature. Special productivity payments work wonders for both morale and bank balances.

For the DPM, however, motivation extends beyond the confines of the DP team. The site engineer requires considerable doses of motivation and encouragement. This can be administered either by the manager of the service department following extensive prodding by the ops manager, or more directly from the installation itself.

Motivating the stationery and printing suppliers tends to be limited to well established procedures. Tearful pleading interspaced with dire threats, while not guaranteeing success at least eliminates tension and promotes the DPM's chances of gaining a leading role at the local rep.

But the over-riding factor where the DPM is concerned is that of fear. The DPM exists in dire fear that the power will fail during a lengthy and critical run; that the control supervisor goes down with mumps immediately prior to the payroll bonus run, or that the reciprocal back-up installation suddenly appears on the scene demanding prime computer time.

Motivation in such circumstances is keeping disaster and senior management at bay. While the DPM is motivated into presenting his achievements, gaining company recognition and raising the status of the DP department, he is even more motivated into minimising problems, mitigating errors and concealing disasters.

All this DPM activity leaves little scope for self-motivation. Perhaps this is the main reason why successive pay scale surveys indicate that the DPM is losing ground. Maybe it is time the DPM stops motivating others and puts in some deliberate motivation on his own account.

1984 and all that . . . .

THIS week's examples of the funny things people say in the media about computers were sent in by John Hoffmann of Wilmslow, and Helena McCloskey of Penarth, who each win £5.

A hospital authority's offer to pay nurses and other staff a week early has misfired — because of a computer. The pay slips went out — and flat-broke nurses went to their banks to cash a cheque. Only to find the computer had sent no money to back up the slips. . . .

A hospital spokesman said: "Several thousand employees could be affected altogether, but we won't know before Monday. We tried to help, but the computer ruined it." — *Sunday Mirror*

Hundreds of South Glamorgan teenagers may be able to find the right job more quickly in future — thanks to a £68,000 computer scheme. . . . The system is based on an unglamorous computer called ICL 2900 and county education chiefs hope it can do for jobless teenagers what Artoo-Detoo did for Star Wars audiences.

South Wales Echo

Ten years ago...

COMPUTER WEEKLY — FEBRUARY 13, 1969

LONDON University installed the UK's second CDC 660 to become the most powerful machine at a British university. It will be connected by online data links to eight of the university's colleges . . . In a bid to become a powerful force in the world computer market, Xerox offered £380 million for Scientific Data Systems of California . . . Two billion dollars sales were recorded by IBM World Trade in 1968 and, according to vice-president Billy Christenson, this represented one third of IBM's sales . . . As a successor to its Line-8 range, Digital Equipment launched the PDP-12, aimed at the laboratory market . . . The use of integrated circuits enabled Digital Equipment to cut the prices of its communication controllers.

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PAT COEN . . . the giants do not show they really understand what is needed.

PAT COEN OF LOGICA VTS TALKS TO RORY JOHNSTON

How Nexos can beat the giants

PROSPECTS are good for Nexos, the National Enterprise Board's latest venture, to flourish and take an important slice of the office system market, even in competition with the giant multinationals. That is the view of Pat Coen, chairman of Logica VTS, the NEB's first associate company in this field, who spoke to Computer Weekly shortly after the joint announcement of the two new companies by the NEB and Logica (CW, February 1). The first job of Nexos will be to take on the marketing of VTS 100, Logica's stand-alone word processor.

In reply to the much-raised question of how Nexos with its £40 million could hope to compete with IBM and Xerox, who were spending billions on R&D in the office systems area, Coen replied that a small new company had many advantages over the giants.

It had no obsolete base of equipment that new developments had to fit into (a reference to the many thousands of IBM magnetic card typewriters still in use). It could move quickly, with no involved political fights over who was in control and where development would be carried out (a dig at Xerox particularly). It had no vested interest in selling other equipment, such as mainframes or telephone exchanges.

In saying this, Coen echoed the views of Muir Moffat, newly-appointed managing director of Nexos, who said at the launch that this association of firms, with its formal, clearly defined relationships, could well work better than integrated companies in which the parts did not talk to each other.

The principal rationale behind the establishment of Nexos, Coen said, was that the office systems area would become of enormous importance in the world economy, and therefore the UK must contribute added value in this field for the sake of its own prosperity.

A crucial area will be the definition of an integrated architecture for office systems, which will allow all the different pieces of kit in an office to interact with each other and yet will be open-ended, to allow for new developments.

Nexos will be setting up a development group, including representatives of its member companies, to do this, and to specify a wide range of products which fit into the architecture. Recruitment of the highly-experienced people needed for this group will be one of Muir Moffat's most critical tasks.

Initial products are expected to include facsimile, store-and-forward voice, voice recognition, graphics output, and software for information retrieval. Further member companies in addition to Logica VTS are expected to be announced within a few months.

IBM and Xerox have been working on designing such architectures for years, but Pat Coen is confident that Nexos's will not be swamped by the weight of the opposition. "The major companies do not show a deep understanding of what is needed," he said. He assumed that different architectures would operate at the same time in different installations.

Standardisation, though, is a major problem in Coen's eyes. There is still no standard for exchanging files between word processors, and Coen sees this as a major problem in the development of useful office systems.

There were three degrees of standardisation, Coen said, and they should be dealt with in order: exchanging media (floppy discs and the like); exchanging files (this was difficult because data formats used by sophisticated word processors were very complicated, delineating moveable areas of text, fixed areas, tables, special character sets, and so on); and finally, exchanging staff.

This last involves a standard user interface so that operators did not have to be retrained. Coen saw this, regrettably, as not really practical. System designers had very strong and opposing views on user interfaces, as a survey of the market had shown.

Asked how successful capitalists like Logica felt about taking on government backing, Coen replied that he saw the NEB as a very adventurous, very well-informed merchant bank, considerably readier to get involved in this sort of operation than those in the City.

He disagreed with Tory MP Michael Grylls' view that the money should be given direct to existing firms such as Logica. The setting up of the marketing and support organisation would be very expensive, Coen said, and Logica did not have the broad-based experience in fields such as fax and voice communications that were required.

The burgeoning problem facing every office system supplier, that of union opposition, came up.

How did one convince the workers of the wisdom of management's proposals?

"If I could answer that," replied Coen, "I'd be out sorting out all Jim Callaghan's problems." He emphasised, though, that the great majority of girls using word processors were happier and more satisfied than they had been with typewriters.

Attached Processor boosts internal power of IBM 3033

A MEANS of checking out a new release of MVS under VM/370 and then transferring the production workload to it without shutting the machine down is a feature of the new Attached Processor version of the IBM 3033 (CW, February 1).

The two processors, each with its own 64K byte cache memory, share all the main memory, and the attached processor also uses the channels of the host. The 3033AP system can be operated either under MVS in tightly coupled processor mode with a single copy of the operating system, or under VM/370; optional systems extensions are available for both operating systems.

IBM calls the new facility dynamic transition facility, and it is only available on the 3033AP at present; deliveries begin in April 1980. After the new release of MVS has been checked out, all new jobs can be submitted to it, while the old release completes all the current jobs.

The old MVS virtual machine is then shut down, and VM can then be removed, allowing the new release to take over as the native operating system, without affecting jobs then running, or MVS teleprocessing networks. The Process is analogous to removing the table-cloth without disturbing the crockery.

The 3033AP can have four, eight, 12 or 16 Megabytes of main memory, 12 or 16 channels, two consoles and a uniprocessor 3033 needs a 3088 multiprocessor communication unit costing £3,517, or £130 a month, for upgrade to 3033AP.

Priced at £3,077,479 or £95,194 a month with 4 Megabytes of main memory and 12 channels, the 3033AP provides up to 70 per cent better internal performance than a uniprocessor running the same job mix. The gain in throughput will depend on how input-output bound the workload happens to be.

Following the retirement of Lord Cromer from the chairmanship and board of IBM UK, managing director Eddie Nixon has been elected chairman, in addition to his present posts. Lord Cromer continues as a director of IBM World Trade Europe/Middle East/Africa Corp, and will act as advisor to the UK board.

Multiplexer based on Motorola micro

THE latest model in the range of time division multiplexers made by Timeplex in the US and marketed outside the US by Racal-Milgo is a four- or eight-channel statistical multiplexer based on a Motorola 6802 microprocessor.

Called the Microplexer M8, it will link asynchronous data sources transmitting at up to 2,400 bps to a single synchronous data line transmitting at 1,200, 2,400, 4,800 or 9,600 bps. An additional supervisory channel can be used to gain performance statistics or communicate with any channel.

Operation relies on the fact that terminals usually transmit and receive data in small bursts, so that the 128-byte buffers on each input and on the Automatic Retransmit on request error control section should normally provide enough delay to wait until the output line is free, if two or more terminals transmit at once.

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Micro conference

A CONFERENCE on microcomputers aimed directly at the small businessman is to be held at the Hilton Hotel, London, on March 28. Called Microcomputers 79, it is being organised by a new consultancy company, Mills Micro, which specialises in systems for this market. Further details can be obtained from the company at 11 Sun Street, London EC2M 2QD.

PERIPHERALS 79

ORGANISED BY THE PERIPHERAL SUPPLIERS ASSOCIATION

WEST CENTRE HOTEL — LONDON
13-14 MARCH 1979

You are invited to a new and exciting event in the Exhibition Calendar. Following the highly successful launch of PERIPHERALS 78 at the Kensington Close Hotel last year, the Peripheral Suppliers Association (PSA) has moved the 1979 Show to a larger and more appropriate venue — the Richmond Exhibition Suite at the West Centre Hotel in London.

PERIPHERALS 79 will gather together the very best in computer peripherals from renowned manufacturers throughout the world. Most of the United Kingdom's leading suppliers will be exhibiting at the Show and include:

S E Labs (EMI) — Geveke Electronics — Cifer Systems — Lynwood Scientific — Sintrom Electronics — Technitron — Euro Electronic Instruments — ITT Modular Instrumentation — Pragma — Penny & Giles — Kode — Trend Communications — Versatec Electronics — Data Dynamics — Data Design Techniques — Electrographic Audio Visual.

Many completely new products will be on display including the very latest in:

Floppy Disc Systems — Visual Display Units — Digital Plotters — Cartridge Memory Systems — Serial Page Printers — High/Medium Speed Line Printers — Printing Terminals — Electrostatic Printers/Plotters — Modems — Micro-based Terminals.

PERIPHERALS 79 will take place on 13th and 14th March and the opening hours are from 10a.m. to 6p.m. on the 13th and from 10a.m. to 5p.m. on the 14th. Entry is free by ticket (obtainable from the exhibitors or from the organisers). Tickets will also be available from the reception desk at the Exhibition on production of the completed form below.

The West Centre Hotel is situated in Lillie Road, London SW6 1UG. The A4/M4 passes close to the Hotel and West Brompton and Earls Court underground stations are in close proximity. Buses 30, 74 and 74B pass the Hotel to and from Hyde Park Corner.

PERIPHERALS 79 is Sponsored by the Peripheral Suppliers Association,
Additional information is available from:
The Organisers, PERIPHERALS 79, Owles Hall, Buntingford, Herts
Tel: Royston (0763) 71209

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Downtime

by Chad

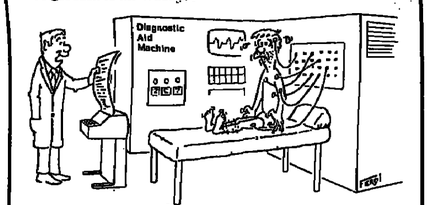
What's in a name? A number, actually

ACCORDING to the London telephone directory there is a gentleman living in West Hampstead called Mr C. Wil5on. Now, let us not immediately jump to the unkind conclusion that the Post Office has cocked it up again. After all, you get some pretty unusual people living in West Hampstead and, you never know, his name might actually be Wil5on. Only recently someone in the States (doubtless California) applied to a court to have his name changed to a number, on the grounds that this fitted in better with today's computerised society.

And very commendable too. I keep saying we must try to make life easier for our poor hard-working computers — words are such a nuisance compared to nice, compact numbers, aren't they? The judge, however, obviously a reactionary of the first order, disagreed, and turned down the request on the grounds that it would "dehumanise" the fellow. It's a comfort to know that if ever I try to do something that would dehumanise me, someone will step in and keep me to the straight and narrow.

To get back to Mr Wil5on, I suppose we have to admit that his name probably should be Wilson, and — aha! it's all the fault of the computer. Readers may be able to help me on this — my memory cells are getting a bit rusty — but I seem to recall hearing of a clever technique called *validation*, whereby if you have an alphabetic field, you go through and check to see it contains only letters, or something like that. But the Post Office won't know about this — after all, they are only just getting around to installing CAFS devices.

The interesting thing is, because of the sort algorithm, Mr Wil5on appears in the phone book 30 pages away from the rest of the Wilsons. His friends must be having a great deal of difficulty finding him. He may not even have found himself — probably thinks he has been left out altogether, and has complained thus to the PO. They will put him in, and C. Wil5on will stay in the book, drifting down through the years, a phantom person waiting forlornly for someone to ring him up. Sounds like a good basis for a story by John Race of Brunel (CW, July 27 1978). A royalty for the idea, please, John.



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On your marks for 1979

ATHLETES and other enthusiasts throughout the UK computer fraternity are already preparing for this year's big sporting contest, Computastars 79.

The aim of the contest is to provide events in which all involved with computers can take part, first in local heats, and then at the national finals at the National Sports Stadium at Crystal Palace, London.

The rules of the competition are intended as a guideline for those wishing to participate, and the success of the competition is largely dependent on the sporting attitude and competitive enthusiasm together with the support of all involved.

The various activities are designed to test the all-round athletic and sporting skills of computer personnel.

The event, which is sponsored by Computer Weekly and Wright Air Conditioning, will have eight regional heats between April and July and the national finals will be held at Crystal Palace on Saturday, September 29.

As in last year's competition, Computastars is aimed primarily at finding the best all-round teams, although again there will be recognition of individual talents.

The five main categories of activities will be running, gymnastics, kicking skills, throwing skills, together with an additional event of a less conventional nature. To provide flexibility at local levels, the events in each of the categories will vary between regional heats and the national finals. The aim of the variation is to ensure that teams are chosen on the basis of genuine all-round talent rather than on specialist skill in one event.

The running event will be over various distances and, dependent upon local facilities, hurdle and steeplechase elements may be included.

Gymnastics will cover selected exercises, but will avoid events that could cause physical harm or be of such a nature as to cause controversial discussion.

Kicking skills will test both ball control and accuracy of kicking.

Throwing skills will be based on eye and arm co-ordination and could range from darts to shot putting.

The "unconventional" event will be designed with audience appeal in mind, but skill rather than chance will predominate.

The eight regions initially selected may be added to or amended according to the geographic spread of entries. The regions, and in some cases the venues, are: North East; North West (Kirkby Stadium, Liverpool); Midlands (Alexander Stadium, Birmingham); South West; East Anglia; Thames North West; Thames South (Crawley Sports Centre).

Plans are also in hand for a Scottish heat, if there is enough support. This will be at Meadowbank Stadium, Edinburgh, and preliminary arrangements have been made for a gala day there.

The principal trophies to be competed for are the Ferguson-Francis trophies for the men's and women's teams; the Computer Weekly Cup and Computer Weekly Rose Bowl for the best individual competitors; and the Queens Hotel Cup for the company or organisation whose men's and women's teams achieve the highest aggregate points on finals day. If more than one men's or women's teams are competing from more than one company, the pairings of the teams must be stated at the start of the finals.

Wright Air Conditioning will once again present medals to winning teams and individuals in the finals.

For teams eliminated in the early rounds in the regional heats, a secondary team competition will be organised. Winners of this competition (details to be announced later) in each region will also be invited to take part in a secondary competition at Crystal Palace.

Conditions of entry

The competition is open to any computer staff from any company/organisation involved in the development, supply or use of computer hardware, software or services. There will be two sections each for men's teams, consisting of five members, and the other for women's teams of three members each.

All competitors must at the date of the competition be employed on a full-time basis and be totally costed to the unit, and must have been employed by the unit before January 1, 1978. Contract staff or freelance staff may represent the unit provided these conditions are fulfilled.

Data processing units with under 50 personnel may enter one men's and one women's team only. Data processing units with 50 or more personnel may enter a maximum of two men's and/or two women's teams.

Data processing units with multi-locations may enter teams from each location or, alternatively, enter teams as a central unit. One competitor has competed in a team, he or she may not subsequently represent any other unit in the competition.

All teams must be prepared to provide a marshal for all rounds which they compete. The marshal may be a team member. The marshals should be available to assist in the running of the heat in which their team is competing. All expenses incurred by teams are the responsibility of the team's own company.

All entries must be authorised by the data processing manager or other responsible executive of the company or organisation concerned.

The closing date for entries is March 10, 1979. No entries will be accepted after that date. The entry fee of £10 for each men's team and £5 for each women's team. This fee is non-refundable for any reason except non-acceptance of entry.

The organiser's decision is final on all matters concerning the competition.

ENTRY FORM

We have read and accept the conditions of entry for the Computastars 79 competition and would like to enter .... men's teams. .... women's teams.

Company .....

.....

.....

Name of unit .....

Number of staff in unit .....

Address. .....

.....

Name of contact for team (s) .....

Telephone number ..... Extension .....

Signature of manager in charge of unit .....

Position held .....

Enclosed is £. ..... to cover the entry fees for .... men's and/or .... women's teams.

The team would like to compete in the following region: NORTH EAST NORTH WEST MIDLANDS SOUTH WEST EAST ANGLIA THAMES NORTH WEST THAMES SOUTH SCOTLAND.

Please circle appropriate centre.
In all matters relating to the rules and the competition, the decision of the organiser is final.
Please send this entry form to: Computastars, 117b High Street, Croydon, Surrey. Tel: 01-688 6690.

IBM users' three-day conference

DES PITCHER, managing director of Plessey Telecommunications, and science broadcaster Peter Fairley will be among the speakers at Forum 79, this year's meeting of the IBM Computer Users' Association.

Theme of this three-day conference, in Bournemouth from April 24 to 26 will be "Into the Eighties."

Pitcher will describe how he sees telecommunications developing in the 1980s, and Fairley will give a talk of general interest, putting forward his view of Britain in the year 2000.

Peter Fairley, one of the Forum '79 speakers.

John McNally, of Modular Technology, will speak on "The Long Arm of the Robot."

Representing IBM, Walter Schmitz, strategy and business planning manager, will talk on "Future Technology" and Stuart Douglas from product marketing will review the year's announcements.

Managing director Eddie Nixon is to give an address, as is customary.

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Lawyers call for computer-aided legal information system in UK

IT is vital that a computer-assisted legal information system be set up in the UK to help in the handling of an ever more complex body of laws; otherwise legal services may become too expensive for the general public. That is the conclusion of a report published this week by the Society for Computers and Law, which proposes the establishment of a National Law Library to serve both lawyers and the public.

To avoid creating a monopoly, the report proposes that the system should consist of several separate inter-connected libraries, all commercially operated but subject to common standards under the control of a corporation made up of lawyers. Information would be supplied to the systems from a variety of sources, such as the law publishers and HM Stationery Office.

The Society feels that the volume of law in the UK has now become so great that traditional manual methods of researching statutes and precedents by looking through books is at risk of being priced out of the market.

Lawyers themselves are finding it increasingly hard to keep up-to-date, and only the big law firms can afford adequately-sized libraries and information services.

The proposed National Law Library would be available for use not only by lawyers but also by members of the public direct, who would not necessarily have to go through a lawyer for this service.

The choice of an appropriate system will be particularly difficult. Computers have been used in other countries for legal retrieval for some time, but not on a very large scale.

Some of the best-known systems are OBAR of the Ohio Bar Association in the US; LEXIS, produced by Mead Data Central of New York; and JURIS, of the US Justice Department.

The report recommends that EEC law should also be included in the system, and that it should be made compatible with existing European systems.

NEWS IN BRIEF

Prestel access costs

ACCESS costs of a sample of nine domestic users of the Post Office's Prestel test service, recorded since October, show an average of £26 a month. A similar sample of business users shows a slightly lower figure. For the public service which is due to start in May, a time charge will be made in place of the present handling charge of 0.5p per frame accessed.

The service now has 80 lines available out of the 200 on the GEC 4080 at Gresham Street, London, serving about 300 users.

Hotels systems

NINE London hotels owned by Grand Metropolitan Hotels group are being equipped with micro based front office computer systems from Hoskyns. The first was installed in the St Ermin's Hotel last year, and a further eight are due to be equipped by May. The order is worth about £150,000.

No connection

US-BASED manufacturers of small commercial computer systems, Qantel, whose machines are now being sold in the UK by General Computer Systems (GCS) Limited, Hitchin, have no connection with Quantel Ltd of Caterham, Surrey, the manufacturer and supplier of digital television equipment.

Kode link-up

KODE has announced a communications feature that enables data to be transmitted over telephone lines between two of its Datawet batch data entry systems. Data can be transmitted from a cassette or 5-inch tape and received by a cassette, a tape or a line printer.

Buck Core

FASTER all electronic emulation of fixed head disc storage in the form of one Megabyte of core memory, called Buck Core, is now available from Sintrom Electronics as part of a complete system configured around the Digital Equipment LSI-11 microcomputer. Built in the US by the Dataram Corp, the system is called BCM-1 and costs £16,120.

In demand

DEMAND for executives in the UK in 1978 was the highest for four years, according to management consultants MSL, which conducts an annual survey of Press advertisements. Of the categories of jobs, general management posts have gone up most over 1977 (27%). Sales and marketing appointments have risen 10%, and those for computer specialists by 6%.

Systems guide

MOST of the relevant facts and figures about most of the small business systems being sold in the UK are contained in a guide now available from Computer Guides Ltd, a subsidiary of the publishers of the monthly magazine, Which Computer. Priced at a modest £24 the guide compares over 90 suppliers and 250 small system configurations.

CSA's new president

FOLLOWING John Ockendon's move to the CAP group to lead the new subsidiary CAP Scientific, he has had to give up the presidency of the Computing Services' Association, and vice-president Jim Donaldson (pictured left), a director of the PE Consulting group, takes over until September.

CAP's representative on the CSA is Barney Gibbons, so for the time being Ockendon will have no official role in the association of which he is a founder member.

International symposium on robots for Milan in 1980

AN international symposium on robot technology that will look at the pressure on the world's manufacturing industry to improve productivity and conditions, and cut costs, is to be held in Italy next year.

To be staged at the Milan International Fair Grounds from March 5 to 7, the 10th International Symposium on Industrial Robot Technology will be made up of three conferences and will be supported by members of robot associations from the UK, France, Italy, Spain, Japan, and the US.

To run concurrently will be the 4NC Robot Automation Exhibition and Conference.

Further information on these and other conferences is available from Dr B. Rooks, IFS (Conferences), 35-39 High Street, Kempston, Bedford. Tel: 0234-853605.

● In an attempt to encourage the rebuilding of what it calls "a sector that has declined in recent years", the National Enterprise board has taken a 49% stake in George P. Brown (Holdings), a manufacturer of robot welding and metal-forming equipment.

The equity stake is valued at £575,000 and the NEB has also arranged a medium-term loan of £600,000 for the 236-worker company.

Burroughs' £3.5m TSB order

KEEPING up the pressure in the banking world, Burroughs has won a £3.5 million upgrade and terminal order from TSB South East. A dual B6807 mainframe is to replace a Burroughs B4700 and B3500 at the Trustee Savings Bank computer centre in Crawley, Sussex, and the new installation is to support over 800 TD700 visual display terminals.

The terminals will be installed at counters and will be used for account checking and updating.

Unlike the Altrincham Group of TSBs, which is installing equipment from Burroughs' new modular terminal range around its Univac 1100/80 mainframe, TSB South East decided against passbook-updating printers on the grounds that cheque account and loan business predominates.

On the takeover front Burroughs is to acquire its UK distributor for cheque, protection and automatic signing equipment, Halsby & Co of Islington, and the Burlington, Massachusetts-based maker of OCR equipment, Context Corp. Terms have not been revealed in either agreement.

News database for NY Times

ONE of the first databases to use the forthcoming Japanese database access service will be the New York Times Information Bank. This contains news abstracts from over 80 journals including the UK Financial Times, and it became accessible from Europe last year via Tymnet (CW, March 2, 1978). It will be offered in Japan by Nihon Keizai Shimbun of Tokyo, publishers of the Japan Economic Journal.

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5th — 7th March	Centre Hotel	Newcastle
13th — 15th March	Ramada Dragonara	Bristol

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- ★ Green Posphor Non-glare screen

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- ★ Selectable Baud Rates from 50 to 19,200 Baud
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- ★ Selectable Half or Full Duplex
- ★ Video Output for External Monitors
- ★ Green Phosphor Non-glare Screen

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- ★ Teletype Compatible
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- ★ Selectable Baud Rates from 50 to 19,200 Baud
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GILB'S MYTHODOLOGY

Making your program more human

WOULD you like to increase the quality controls on input data in your application? Are you willing to spend some secondary storage space, and system development time to do so?

The concept I am suggesting will not work on every application, but if you are willing and able to adapt it imaginatively to your applications, I would think you will find many uses for it.

We have called this technique pattern checking.

In a nutshell, pattern checking is simply a programmed version of what human clerks and input data observers traditionally did, before data processing eliminated the human checking factor, and instituted poorer controls, due to electromechanical limitation initially, then due to tradition.

The human observer registers certain regular patterns of numbers over an extended period, and reacts, at least with a second thought, to unusual variations in such patterns. Indeed such pattern checking is quite common in intelligence tests.

Imagine if you are shopping in Marks and Spencer and see the following series of prices: 9.99, 7.99, 3.99, 14.99, for the first 50 or so prices you noticed on the clothes displayed.

Then imagine what you would think if a sales clerk quoted you a price as "nine." You might want to check that you had heard properly. Maybe it was only the last digit you heard.

Certainly the amount is inconsistent with the marketing illusion the shop is trying to create. It is not necessarily wrong: but you would be wise to check it.

Now let me suggest a way of implementing similar logic in a flexible and work-saving manner. The amount we want to check could be a quantity or an amount of money, for example. Let me illustrate the principle with an order quantity. If we observe our application we may find that some of our products are ordered in typical quantities such as even numbers, dozens, multiples of ten, multiples of one or more package groupings or some other pattern. You might observe this informally in an hour of your own time, or you might like to do a statistical tabulation based on a month's order entry logs, using a simple computer program.

You should, if the result is encouraging in the sense that there are many common patterns (don't worry about the exceptions) then allocate a number of additional fields in *each* product record. The first field contains one or more codes for the probable pattern. For example: T=TENS, D=DOZENS, E=EVEN, P=PACKAGE, ?=NOT YET ESTABLISHED, A=ANY, .=DECIMALS. Single codes could be given for common combinations, or several characters could be allocated in the record. The pattern could initially be set to "?" and a one time analysis, automatically made on recent order data sorted by product identification, could establish a possible frequent pattern.

Whenever an order quantity breaks with a pattern, the operator could be asked, if online, to verify it. If offline a suspected error list might be printed for double checking. If the online operator *confirms* the quantity we might add "one" to a second extra field in the product record. This will give us a measure of how often the pattern causes us unnecessarily to confirm a correct entry. If, however the operator changes the entry, we should add "one" to a third extra field in each product record. This gives us a count of the errors which this particular pattern for this particular product has helped us to catch.

These two extra fields allow us to estimate the value both of particular patterns, so we can adjust and change those that are ineffective. They also allow us to estimate the net value of this set of controls in our particular environment. If it doesn't pay off, we should drop it, but if it does pay off we should teach it to others and look for additional applications for the principle. Note that this method is not the only check used.

It has been particularly difficult to find documentation of variations of this principle — both with regard to the use it is put and the actual results achieved (it is even rarer to instrument the system as we have suggested here) so I would be particularly interested in receiving reports from readers, whether in the form of a letter for publication or a private communication so that I can share the results with others.

PROGRAMMER NOTES

Code efficiency of assembler ensures its continued use

DESPITE the cornucopian flood of high level languages for microprocessors — and great leaps forward in memory size — the code efficiency possible with assembler will ensure its continued use for many applications for the foreseeable future.

Users, for example in process control, will thus continue to pay the typical penalties of assembler level programming, including slower development, more difficult maintenance, and a lower level of confidence in the finished software.

However, as highlighted in the recent correspondence on Basic, there is a fundamental distinction between a language and the software environment which typically supports it.

Both programmer productivity and software reliability can be dramatically improved by such aids as interpreters and interactive debugging tools.

As was pointed out in the correspondence, such facilities are intrinsic to some languages and very common in others, but can in theory be implemented for any language. Whether or not they are is often explained by the history of its development and use. Assembler, traditionally associated with the higher levels of programming expertise, has in the past generally enjoyed only minimal environmental support. Recently though, the needs of microprocessor users have spurred on the development of sophisticated assembler development systems.

One of the most interesting of these is the MicroSim system jointly developed by Practical and the London consultancy D. H.

MicroSim appears to the user to be an interpreter. As each line of assembler is typed in, the system checks it for syntax errors and assembles it into machine code. If there is an error, it is reported at once to the user, who can correct it before continuing.

As part of the checking MicroSim at the same time resolves internal and external references. Forward label references are entered to an address list for future completion, while calls to an as yet non-existent segment result in the system automatically creating it. There is no formal linking step.

Some of the most powerful facilities are those for testing and are feasible because MicroSim is a simulation system running on a host computer rather than on the target microprocessor.

One such facility is based on a design concept called hyperspace segregation. Each program word is labelled with a label indicating its content: data, instruction, or address. During testing on the host, attempted type violations are trapped and reported.

The system is also notable for permitting full symbolic debugging in conjunction with plain English diagnostics.

The overall effect is to speed up the development cycle dramatically. Typical users report a productivity gain between 300 and 400%.

SOFTWARE FILE

PETER HEWITT UNBUNDLES THE 4300 SERIES

Productivity is now the single most important problem both for IBM and its users. This is the message rammed home by the massive range of software announcements accompanying IBM's launch of its strategic systems for the 1970s, the 4300 series.

For users, one of the key points is a greatly increased emphasis on packaged software and hardware. This will range from the delivery and maintenance of complete software environments, System IPO/Es, to the supply of fully functioned "application machines." There is also an extensive range of new interactive tools, including a time shared program development system for successor to DOS/VS, DOS/VSE.

All of this, IBM hopes, will make it easier to install, develop, and maintain software, thus enabling customers to stabilise their programming costs.

For IBM itself, productivity problems centre round the question of support. A reduction in the per-CPU support requirement is essential to its entering the high volume low cost market at which the 4300 series is aimed.

It is complemented on the hardware side by the introduction on the 4300 of logical diagnostic subsystems, controlled by microprocessors, and the inclusion of the Remote Support Facility, giving access to the Retain diagnostic databank over public telephone lines.

Throughout the software announcements, two aspects stand out above all else.

The first is the enormously enhanced role of VM/370. Native mode VM is seen by IBM as a possible operating system on both the new processors and it forms the base for the two recommended operating system combinations on the 4341. Three major new program products have been introduced in support of the new role, which has been forecast in Computer Weekly for the last year (CW, January 5, 1978).

The second is the high degree of System 370 compatibility. The majority of the new software — including, for example, DOS/VSE — will also be supported on 3031 and 370 processors, while the 370 compatibility mode on the 4331 and 4341 implies that any existing 370 work can be migrated without alteration.

Users will thus enjoy virtually complete forward and backward compatibility, though the performance advantages offered by the ECPS firmware on the new machines would naturally encourage the use of native mode for new applications.

In the case of DOS/VS, though, strong incentives exist for migrating to DOS/VSE as soon as possible. One is that DOS/VS will not be supported on the 4331 after the end of this year. Another is that the new system offers performance advantages over the old even when running in 370 mode; these have been measured at 7% on a 370/145.

Series E shows road IBM is taking

DOS/VSE

AS predicted in Computer Weekly (January 25) the announcement of a massively enhanced version of DOS/VS as the key operating system for the 4300 series has been accompanied by more unbundling, with many functions previously intrinsic to the operating system now offered as licensed program extensions to DOS/VSE.

The foundation for all the new and enhanced software is VSE/Advanced Function — one of 33 new licensed program releases to be announced.

Among the products for which it is a prerequisite are new implementations of Vsam and Power, and the new telecommunications access methods Btam-ES and ACF/Vtam-E.

It also provides support for the new time sharing program development system, Interactive Computing and Control Facility (ICCF). The system is also a central component of all VSE systems, providing such facilities as prompters, a full screen editor, job entry, a job execution monitor, and text manipulation.

Among intrinsic features of Advanced Functions are disc space management, device independence, 12 partition support, automatic IPL, fast transient fetch, library sharing across partitions, multiple procedure libraries, and multiple label areas on Dasd.

Two stages of release have been announced for nearly all the DOS/VSE software, with the first scheduled for June and the second for December.

VM

A NEW release of VM — with considerable microcode assistance and powerful facilities based on three new program products — supports the greatly enhanced role of VM on the 4300 series.

There has also been a second release of VM Basic Systems Extension, for the first time supporting the DOS RPG II compiler. BSE Release II is a prerequisite for many of the 4300-specific devices, while base VM support on the processors is provided by the new VM release, Release 6.

Much of the software enhancement is designed to help make stand-alone VM/CMS more credible as a production system. In the case of Release 6 itself, this is evident for example in the introduction of CMS support for DL/I.

It is also the main theme of the new program products, consisting of:

- IFS (Interactive File Sharing), which allows separate CMS machines to share files.
- DMS (Display Management System), which allows programmers to build screen formats interactively for future use in application programs.
- RSCS/Networking, which provides networking capabilities superior to those in the existing Vnet product.

VM Release 6 has also introduced a "small systems option" which offers better [illegible] improvement and performance for dedicated VM [illegible].

Performance is dramatically enhanced on both the 4300 processors with ECPS 'firmware', which cuts VM supervisor time by up to 80% on the 4331 and by up to 82% on the 4341.

VS1

WITH the announcement of Release 7, IBM has granted OS/VS1 a stay of execution. However the company at the same time stressed that MVS remains the large system control program. This implies that VS1 is a stepping stone on the growth path.

This role for VS1 is confirmed by features of the 4300 announcement. Although supported by ECPS on the 4341, the operating system will run only in 370 compatibility mode on either processor, and does not support the new storage devices.

The new consoles, one of the new printers, and the storage control unit are the only 4300 devices supported.

Significant enhancements in Release 7 include new facilities for cross-partition communication, and support for concatenated procedure libraries. There have also been performance improvements, notably a preferred page facility.

Performance improvements are also offered when running under VM, which IBM recommends as the host operating system for VSI on all systems exceeding two Megabytes.

Big revenue expected from licensing

ALTHOUGH IBM is continuing its policy of providing system control programs free of charge, it will be expecting to earn considerable revenue from licensed program products on the new machines. Much of this is likely to come from System IPO/Es.

This becomes particularly clear from consideration of the 4331. With most of these machines going to new users and a greatly reduced level of standard software support, most sites are seen as needing an IPO/E to get their systems operational at all.

Packaged, pre-tested, and with each component maintained at its current release level, the key feature of the IPO/E is that much lower level skills will be required for installing system software and maintaining an operational system.

The IPO/Es are also designed to assist programmers and operators, with straightforward prompting systems.

Six basic IPO/E environments are available.

On the 4331, two packages are offered, based respectively on DOS/VSE and VM/370 Release 6. When enhanced with CICS/VS and DL/I, the former is quoted as the recommended DB/DC environment. The latter is seen as suitable for small data entry, batch, and problem solving roles.

On the 4331, the two recommended IPO/Es both use VM as a guest operating system. These are VM/DOS/VSE and VM/370 plus VSI Release 7. Also available are native mode DOS/VSE and VM systems.

Prices for these range from around £800 per month for a typical VM or VSE stand-alone system, to as much as £1,700 for a VM/DOS/VSE configuration.

Manufacturing control package in Ansi Cobol

CONCURRENTLY with the new systems software, IBM announced a new applications package for manufacturing control that could be the basis for the first "application machine" offering.

Called Bmpics, the software consists of 16 related application modules and was developed from the Data Centre package Prince. It is designed for the 4331.

The package handles the common manufacturing industry functions of material management and cost planning, including components for engineering data control, inventory, and order release. An integrated system, it is intended to be installed without the need for additional coding.

Online facilities are provided for inquiry and date entry, while the remainder of processing is in batch mode.

The package is written in Ansi Cobol and runs in native mode on the 4331. Required control program support includes DOS/VSE, DL/I DOS/VS and CICS/DOS/VS.

Latest release of IMSL Fortran subroutine library

FURTHER support for minicomputer users is the main feature of the latest release of the IMSL Fortran subroutine library. With Edition 7, to be released this month, the minicomputer libraries, which were previously subsets of the library, will contain the full set of 458 routines.

The edition also includes a number of additions to the library, notably 38 basic linear algebra codes and routines to make the library easier to use.

Other enhancements include further standardisation of subroutine names and argument lists across different hardware types to increase the portability of user programs.

Free form input for Mark IV

FASTER program development is the chief benefit claimed by Informatics for a facility newly available to Mark IV DOS users, namely free form input. With the facility, all the entries normally associated with Mark IV fixed format can be made online at a terminal. It also allows users to take advantage of online DOS text editors. Free form input is already available to OS users for Mark IV.

Dutch subsidiary

A SUBSIDIARY in Holland has been set up by Leasco software in conjunction with Storkdata, the computer services subsidiary of the Vmf-Stork group. The new company, S+L Data Systems, will offer services ranging from consultancy, through turnkey systems, to the sale of software packages.

Puzzler

THIS week's problem is contributed by A.J. Savage, of London NW9. As every accountant should know, the numerical difference created by inadvertently reversing a pair of digits is always divisible by 9, e.g. 36,267 transposed to 32,667 gives a difference of 3,600, which equals 9 x 400. What type of error creates a numerical difference that is always divisible by 9? See page 61 for solution.

FREE SEMINAR

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OP SPOT

By Bernard Allen

Transition without tears at Marks and Spencer

"THE team effort I get from my operations staff is tremendous: their commitment is phenomenal."

Your average DP manager might utter such words in a last-ditch effort to pacify a band of rebellious operators armed with shotguns and after his blood. Chris Nunn needs no such prompting.

But then the head of computer services at Marks and Spencer's West London installation is no run of the mill manager; his 18 years in computing have been spent entirely in the operations sphere.

And when I met him, he spoke with an almost paternal pride about the technical expertise of his operations people and the vital part they play in the running of the site.

The emphasis is very much towards live work and meeting deadlines. If the online operations staff need technical support they get it quickly and efficiently, regardless of the time of day or night.

Said Nunn, "Our service controllers (shift leaders) do a management job 24 hours a day. They can call on whoever they need to ensure that the work gets processed."

Stressing their importance, he continued, "If a service controller says 'jump', we all jump. That means Terry Mitchell's guys, the programmers and the management. And if a programmer is called in during the night he stays until the problem is sorted out or gets the system analyst if need be."

Members of the operations technical support groups, key programmers and managers may be contacted at any time by means of radio pages.

The site is a member of a "club" comprising eight installations which provide back-up facilities for each other.

He considers standby to be an on-going concern; the procedures and media are tested to take new systems into account.

He said, "We work on the basis that things won't work. We actually practise standby: we pick up our spare media, take it to the other sites and run the work. Then we come back, take

Chris Nunn

it to the other sites and run the work. Then we come back, lick our wounds and change the procedures. Seriously, though, it's gone like nobody's business."

According to Nunn, the operators are treated as "intelligent individuals and are actively encouraged to give their views on the systems, applications and the general running of the site."

He said, "Everyone — from the lowest grade to the highest — is encouraged to speak up if they don't like the way something is being done."

He continued, "Rarely do we reach the court-martial situation when you have to say to one of them, 'You — in my office!' It's usually enough to say, 'That's interesting, what you're doing with that tape, don't do it again!'"

For their part, the operations staff get a thorough technical and managerial training. When a trainee joins, he embarks upon a five-year career progression scheme which might lead to the position of service controller, a place in one of the operations support teams, or programming or systems analysis.

The site was run on rather different lines when Chris Nunn joined as operations manager in October 1974. Then it had an ICL 1904A with 128K of store, three EDS 8 disc drives and seven track tape units.

Said Nunn, "Sometimes programs were released by a programmer throwing a tape on the counter of Job control saying 'use that for tonight's production run,' and then vanishing for the weekend. So I had to get the operations side cleared-up."

His first step was to recruit Terry Mitchell, who is now operations manager, from Imperial College, and head of technical support, Harry Godfrey, from Eastern Gas.

"Both have extremely strong operations backgrounds and we set about establishing some operations standards. We beefed-up the shift structure, the ideas of service controllers and support teams, and introduced proper documentation and program validation."

Before that, Marks and Spencer had commissioned Baric to design a big online system and, inevitably, they became deeply involved in the project.

In May 1975, the section moved to its current site in Gunnersbury, West London. They were involved in the design and conversion of the building and an ICL 1904S was installed. The following year it became Marks and Spencer's computer services department.

Nunn explained: "The Marks and Spencer board of directors decided to cancel the order for the online system. They also decided to take over the Marks and Spencer unit of Baric as their own computer services department."

And in June 1976 a staff of 65, comprising operators, programmers and systems analysts joined Marks and Spencer.

He continued, "So Marks and Spencer, after having used a bureau service for 10 years h... its own operation at the flick... switch."

Since then, their main objective has been to keep pace w... the needs of the company's... that end, the operations and... velopment staff has been d... led, and the hardware and s... ware have been increased b... in terms of size and sophis... tion.

He said, "In machine ter... we have moved from a 19... running under a mac... executive, to a 1904S with d... and tapes and using George... and a 2970 running under V... It.

"So, all in all, we have i... creased the number of s... relocated the site and alterna... technology. All that took p... over four years and we have h... only 3% of our staff. That's n... bad."

● Next week I interview some... the staff, and report their views... the set-up.

HINT OF THE WEEK

George 3: Servant or master?

IS George 3 a tyrannical master, ordering the operator about the computer room or an aide ready, willing and able to help him in time of need?

Ron Linton, computer operations controller at Manchester Poly, once described it as "despotic," or over-powerful, and said he preferred the George 2 operating system (Op Spot, CW, Sept 28, 1977).

But Geoff Wescott, author of this week's hint, claims that "it always comes to the rescue".

A software programmer and former senior operator, he writes: "When I was an operator at Hawker Siddeley Aviation, we used to print long lists of output, or, in George 3 terminology, listfiles.

"Each listfile was preceded and followed by a header and trailer consisting of six lines of characters across the page. Thus to extract a listfile, you merely had to find your header and trailer labels.

"That method works fine for short listfiles, but when they are longer — and some are as big as 300 pages — it is not so good.

"Now George 3 allows the operator to offline printers by means of the 'Wrong' command, which has the following format:

WR Unit Number,

"And if the unit is printing a listfile, it will send the operator a message of the form 'Unit U15 Waiting To Be Wronged' and continue printing."

He goes on, "But, and this is the good bit, it will remember the request and at the end of the current listfile it will Wrong the device and cease printing.

"At that point it issued the following message:

Unit U15 Wronged

"So, when a long listfile is being printed, all you have to do is Wrong the unit, and wait for George to tell you that it has carried out the command. Then you take your listfile from the printer and get it going again by using the Right command thus: RI U15."

He concludes, "In this way George 3 will spilt up your listfiles for you, and all you have to do is Right and Wrong the printer!"

LETTERS TO THE EDITOR

Creating an image

THE image of computers and computer people (Downtime, January 4) is the creation of the computer people themselves, particularly the manufacturers. They can hardly complain, therefore, if the uninitiated take it seriously.

In the application of computers and microprocessors to typing, the office equipment PR boys have not only made extravagant claims, but by coining the term "word processing" have quite deliberately sought to mystify something that in principle is simple and pretty mundane. As a result I, and doubtless others like me, spend a lot of time trying to explain what "word processing" is and why there is no need to fear it.

At the same time certain elements in the trade unions are finding it easy to mount a barrage of often disingenuous and always alarmist misinformation, drawing gleefully on ammunition provided by the equipment suppliers themselves. They are thus able effectively to hold up the development of more efficient office systems (particularly in the public sector), to the ultimate detriment of everyone — not least the suppliers. Let us hope that they (the suppliers) have learned a useful lesson for the future.

Meanwhile it is refreshing to read Chud's dispassionate assessment of the impact of so-called "word processors." He could reasonably have added that — incidentally in London it is so difficult to recruit typists, the question of the number likely to be replaced by these machines is in any case academic.

MANAGEMENT SERVICES PRACTITIONER

Name and address supplied

Wake up Sheffield!

I READ with interest that the ILEA has purchased 30 Research Machines 380Z microcomputer systems, especially in view of Sweeten's comment "The Midlands, Liverpool and the North East are where things are happening" (CW, January 18).

As a physics teacher and one who hopes shortly to introduce a computer studies course at Newfield School, Sheffield, I occasionally get the feeling that the action is all around but certainly not in Sheffield. There is a great deal of prevarication about which system to adopt, although in my view the 380Z is the obvious candidate. I think that this attitude is in part due to the lack of "computer industry" in this area. We don't even have a single computer shop, which for a city in excess of 500,000 people must be some sort of record.

Down in the "Soft South" where computer business (hardware and software) proliferate, the ILEA and other authorities are obviously attuned to needs.

Please wake up Sheffield. I am tired of it being the biggest village in England.

Dr R. A. COOKE

Sheffield

THE EDITOR welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.

Universities sign 'substantial' terminal products discount deal

UNIVERSITIES throughout the UK and Ireland are now able to obtain a range of standard terminal products at substantial discounts, following a deal between the Inter-University Committee on Computing, and Geveke Electronics. The company is making sizeable savings on the cost of selling, by offering only limited demonstration facilities, and in return will supply machines in any numbers, even singly, at the 50-off price.

Since the universities know exactly what they want and the range of equipment is limited, this benefits both parties.

Four machines are offered: the Diablo daisy-wheel printer, the Teletype 43 matrix printer, the TEC 502 low-cost VDU, and the Tektran Industries cassette drive. The saving on a daisy-wheel printer is about £300.

This is a trial scheme due to end on July 31, but may be extended indefinitely. The product range may also expand, to include micro floppy disc drives and more elaborate VDUs.

Geveke is talking to ACUCHE, which represents colleges and polytechnics, for which a similar deal may be arranged.

'Only fully-automated chip mounting system' says ITT

REEL to reel automatic chip mounting equipment has been installed at ITT Semiconductor's factory in Footscray, Kent. Developed at the company's Freiburg, West Germany, plant where it has been in use for two years, the equipment is claimed to be the only fully automated chip mounting system in the world.

It will play an important role in ITT's drive to achieve an overall 20 per cent annual growth rate in advanced microelectronics, doubling turnover by 1982 to become one of the world's top five semiconductor producers with 10% of the world market.

The unit shown here takes individual chips from a segmented wafer and connects the leads in the carrying frames to the pads on the chips with 28 micron gold wire. The equipment is self-aligning.

Over the last two years £5 million has been invested in this and other automatic assembly line equipment at Footscray, as well as ion implanters and projection aligners for water production, automatic test systems for quality control and computer aided design equipment.

A further £10 million investment is planned, part of which is to be funded by the Department of Industry (CW, September 7, 1978) to get into VLSI production in the quantities needed to make it economic.

Computer aids jobless teenagers

JOBLESS teenagers in South Glamorgan may soon have an easier time finding work, thanks to a special computer system being developed by the county education department's careers service.

Lists of applicants and vacancies held on the county council's mainframe will enable careers officers to compile short-lists without having to search by hand through thousands of cards.

Initially there will be two separate parts of the system: one for applicants and another for vacancies.

When looking for likely people to fill a job, the careers officer will key in such factors as age, sex, number of O-levels, and area of residence, and the machine will carry out a coarse selection to produce a short-list of say 20 names. From these the officer will probably select six for interview.

Similarly, when a young person comes into the office a search can be made on the vacancies file.

There is no automatic correlation of names with jobs yet, but this may be introduced later.

John Maxwell of the education department, says the project is costing about £45,000 for programs and extra terminals. It runs on a 1900 which is due to be upgraded to a 2972 in June.

The careers service is separate from employment exchanges and jobcentres, which are run by central government.

Select Committee to look at micros

THE Parliamentary Select Committee on Science and Technology has decided that its technological innovation subcommittee should investigate the impact of microelectronics on industrial innovation in the UK.

Electronic mail bureau opens in Stockport

A BUREAU offering word processing and electronic mail services to the public has opened in Stockport, Cheshire. The firm, called Tortext, will send documents to any recipient who has, like the bureau, a Vydec or Wang communicating word processor.

Tortext's main business at present is in preparing specifications for engineering companies, bills of quantity for surveyors, direct mail shots, and the like.

Export documentation, which is now becoming highly standardised, is a particularly fruitful field for WP, according to Len Anderson of Tortext. Phototypesetting from WP documents can also be done, he said.

Providing an electronic mail service for third parties is politically somewhat contentious, because it involves the Post Office monopoly of common carrier services. According to a Post Office spokesman, a licence is required, but at present the Post Office is happy to grant such licences because it does not consider such a service is competing with the mails.

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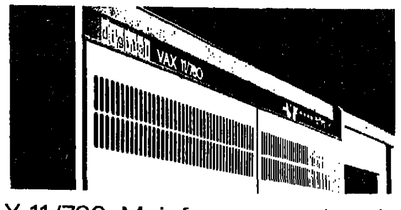

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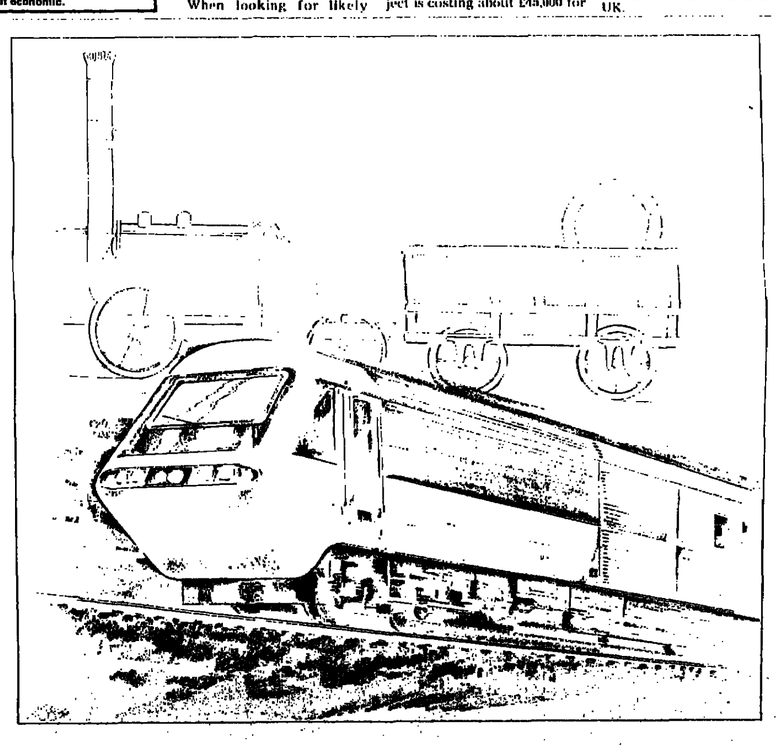

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PEOPLE AND EVENTS

Ex-governor for Control Data

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Muir

A FORMER Minnesota governor, Rudy Perpich has been appointed by Control Data Corp to the position of vice-president and executive consultant of Control Data Worldtech. In his new position, he will be responsible for international trade development, and also for the development of trade opportunities in Eastern European countries for Worldtech and for Commercial Trading Imports, another Control Data subsidiary.

Perpich, who has a doctor of dentristry degree from Marquette University, Milwaukee, was governor of Minnesota from December 1976 to the end of last year. He was previously the State lieutenant-governor, and served in the State Senate from 1962 until 1970.

Ken Burningham has joined Redifon as international systems engineering manager. Until recently he was European sales manager with Digital Development Corp. Appointed as economic forecasting manager is Ken Churcher, who was previously management services administrator for Redifon, and before joining the company worked for the National Association of Head Teachers.

Brian Cole has become an area sales engineer for the South West region for Sintrom Electronic. Prior to joining the company, Cole was a salesman for test equipment with Siemens.

Appointments at Redifon

Chris York has joined Redifon Computers as systems analyst for the London branch. He was previously a systems support engineer with ICL.

Promoted to the position of systems analyst for the Scottish branch is Maria Muir, who joined the company as an instructor and was previously a junior systems analyst.

Anthony Alcock has been appointed as financial director for Data Recording Equipment. He was previously director of finance with Data 100, and is also a certified accountant. Formerly special accounts manager, David Lax has been promoted to the position of UK and International sales manager, controlling sales of products in the UK and Europe except France, Austria and Germany.

Nick Thornburn has been appointed distribution manager for the UK sales operation for Siliconix, following the move of Barry Boulton from this position to Siliconix in Santa Clara, where he will assume responsibility for linear IC marketing. Thornburn was formerly accounts manager with ITT Semiconductors, and before that was with Compton Parkinson.

Diana Bennett has become a consultant in the training division of BIS Applied Systems. She was until recently a senior systems designer with the Royal Borough of Kensington and Chelsea.

David Daley has become area personnel manager for North West Europe for Data General. He joins the firm from Univac where he was employee relations manager. In his new position he replaces Owen Wright who has been promoted to compensation and benefits manager, based at Data General's European headquarters in Paris. Tony Gray has become district manager for the North, based in Manchester. Before his promotion he was branch manager for the South East.

Ray Lett has become senior salesman for major accounts between London and the South Midlands, for Advanced Micro Devices (UK). He was formerly an OEM/industrial salesman with Motorola.

Alan Bell has been appointed Northern region marketing manager for the data processing division of Honeywell Information Systems. Bell, who will be based at Cheadle Hulme in Cheshire, was formerly marketing manager for the Honeywell branch serving Littlewoods.

NATHOLIE is to be the name of National Holidays' new computer. It was the suggestion of June Mears, who won the company's nationwide competition to find a name for its computer booking system. Mrs Mears, who works at the Ollerton branch of Hyde-Barker Travel, is pictured here receiving first prize, a portable television, from National Holiday's marketing manager John Kelly, with (from left) the firm's sales manager Mike Bird, managing director of Hyde-Barker Travel Michael Hyde-Barker, and director John Vickers. The computer is a Digital Equipment PDP-11/70 in Sheffield.

OBITUARY

ICL's Richard Dryden dies in motoring accident

RICHARD DRYDEN, one of ICL's most promising young managers, died in a motoring accident in Luxembourg on Friday, February 2

Since joining ICL 13 years ago as a computer operator, Dryden, 31, had many and varied jobs within the company. He worked on early releases of both the 1900 George III and the System 4 Multijob operating systems, and later he moved on to the 2900 series in its early days.

His last project concerned the installation of a 2980 system for the European Commission in Luxembourg where he was customer support manager. He leaves a wife, three sons and a daughter.

DIARY

FEBRUARY 18
Numerical methods in earthquake and dynamic design. Computer Applications and Methods Group. Institution of Civil Engineers, London SW1. 18.00.

FEBRUARY 19-21
Software auditing. Infotech seminar. Cafe Royal, London. Tel: Dave Bates on 0628 35031.

FEBRUARY 20
Communicating sequential processes. C. A. R. Hoare. BCS Formal Aspects of Computing Science Group. Polytechnic of Central London, London W1. 18.30.
Word processing. IDPM, W of London to Oxford branch. Bull Hotel, Gerrards Cross. 20.00.

FEBRUARY 21
A software packaged future – are we getting value for money? Institute of Data Processing Management. Pearl and Dean Studio, Broadwick House, Broadwick Street, London W1. 18.00.
Word processing and information retrieval. BCS Information Retrieval Specialist group, City University, London. 14.00.
Cobol on microprocessors. BCS Cobol specialist group. Polytechnic of Central London, London W1. 13.30.
Workshop control by computer. BCS Leeds branch/British Production and Inventory Control Society. Parkway Hotel, Leeds. 18.30.
Advances in computer peripherals. J. McNulty. BCS Belfast branch, Wellington Park Hotel, Belfast. 20.30.

FEBRUARY 22
Getting into computing, for the distributive trades, seminar. NCC/Computing Services Association, Mount Royal Hotel, London. Bookings tel: 061-228 6333.
Development in microprocessors and microcomputers. A. d'Agapeyeff. First of the Annual Grace Hopper lectures. Thames Polytechnic, Wellington Street, Woolwich. 18.00.
COTEN, telecomms in the BSC. Dr Ian Dewis. BCS S Wales branch. BSC Welsh HQ, Gabalfa, Cardiff. 19.00.
Applications of microprocessors. BCS Merseyside branch. Computer Lab, Liverpool University, Liverpool. 18.00.

FEBRUARY 23-25
Meeting. IBM CUA Operations group. Norbreck Castle Hotel, Blackpool. 10.00.

FEBRUARY 27-MARCH 1
Which distributed system? Infotech buyer's forum. Regent Centre Hotel, London. Tel: Clive Smith on 0628 35031.

FEBRUARY 28
Visit to police headquarters. BCS N. Staffs branch. Staffordshire Police HQ, Cannock Road, Stafford. 19.30.

MARCH 1
Word Processing. Mrs Barkley. BCS N Wilts branch. Churchill House, Wootton Bassett. 20.00
The social implications of microprocessors. K. Owren. IEETE. Imperial Hotel, St Davids Hill, Exeter. 19.30.

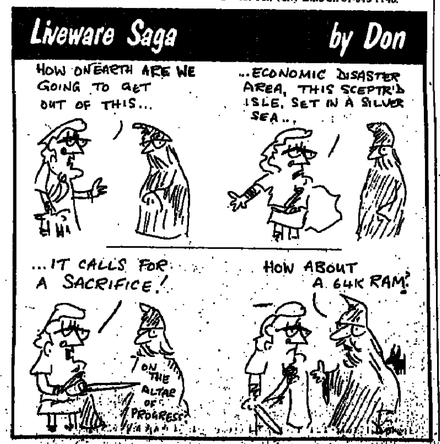
MARCH 2
The renewal of interest in machine translation. R. Johnson. BCS Natural Language Translation Group. King's College, Strand, London WC2. 18.00.

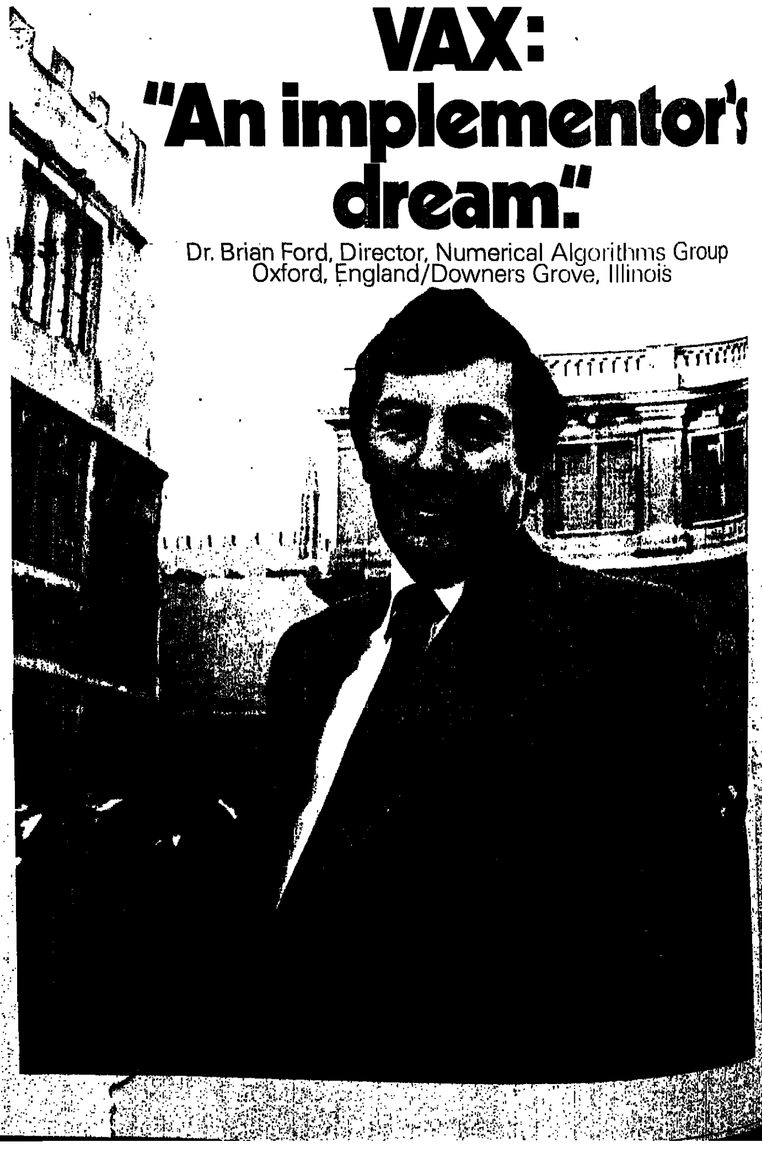
MARCH 5
Mascot — a modular approach to software construction, operation and test. BCS East Anglia branch. Eastern Electricity board, Russell Road, Ipswich. 19.00.

MARCH 6
Voice input — the next computer revolution. J. Saunders. BCS NW London branch. Railway Hotel, Greenford. 19.30.
Word processing. M. Marriott. BCS Cheltenham and Gloucester branch. Gala Club, Fairmile Gardens, Gloucester. 19.30.

MARCH 6-7
Martex '79, Europe's first specialist exhibition for the leasing and used computer business. Felbridge Hotel, East Grinstead, Sussex. Organised by Walker-Ellis Ltd, 54 Dundonald Road, London SW19. Tel: Tony Ellis on 01-543 1148.

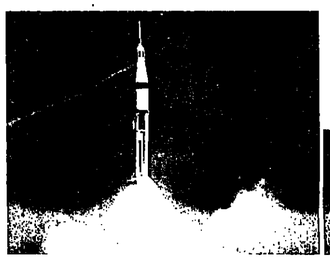
Liveware Saga by Don

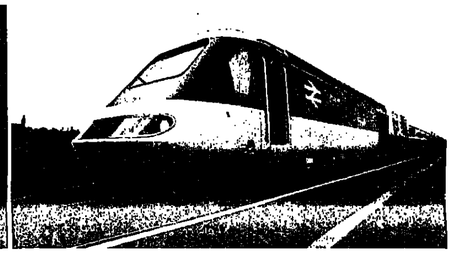




VAX: "An implementor's dream."

Dr. Brian Ford, Director, Numerical Algorithms Group
Oxford, England/Downers Grove, Illinois





For the Numerical Algorithms Group, the plain fact is this: "Software implementation was faster on the VAX-11/780 than on 25 other major machines."

Before VAX, Dr. Ford's staff had implemented NAG's complex FORTRAN Mark 6 Library on 25 major machines ranging from minis to mainframes, including the Burroughs 6700, CDC7600, Univac 1100, and IBM 370. The average implementation time was 13 man-weeks.

VAX took five.

In Dr. Ford's words: "The NAG FORTRAN Mark 6 Library consists of 345 subroutines covering the major areas of numerical mathematics and statistics. It's used in applications such as structural design, nuclear physics, economic modelling, and academic research.

A successful implementation requires the correct functioning of the 345 library routines to a prescribed accuracy and efficiency in execution of NAG's suite of 620 test programs. Whilst the activity is a significant examination of a machine's conformity to the ANSI standard of the FORTRAN compiler, its main technical features are file creation, file comparison, file manipulation and file maintenance."

And then there was the record of VAX reliability: "No problems were encountered in the VAX/VMS software even though approximately 3000 files were being handled. The operational availability time for the machine was close to 100%, an outstanding statistic for new hardware and a new operating system."

What all this demonstrates is that some of the most sophisticated FORTRAN routines in the world implement easily on VAX. That VAX capability exceeds that of many machines far more expensive. That the VAX-11/780 is more than the most powerful 32-bit computer in its price range. That VAX is truly "an implementor's dream".

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MICRO NEWS

Edited by Martin Banks

£500,000 for training schemes

OVER £500,000 has now been committed by the government to supporting microprocessor training schemes, and according to Alan Williams, Minister of State for Industry, the number of training courses available will double in 1979. The DoI is also working with the Open University on an awareness course on micros for managers, and a technical course for engineers.

Facts for small town police

WORK now being carried out by a research group in America may give small town police the same type of statistical patrol, and manpower information currently available only to big city police forces in the US.

The work is being carried out by the Institute for Public Program Analysis in St Louis. The end product is a software package called Patrol/Plan.

Imsai instruction

STAFF at Woking-based Data Precision get in-depth instruction on software development for the Imsai VDP80 microcomputer system from managing director John Cameron (left) and Jean-Marin Reisdorf, managing director of Imsai's European distributor Electronique et Photo Equipment, of Buxy, France.

Data Precision has, since last October, been the sole UK distributor of Imsai systems.

Reisdorf was at the company's headquarters last week assisting in the development of software for a County Council order for Imsai equipment that is expected to be placed this week.

His company has been Imsai European distributor for some three years, since the US manufacturer first decided to penetrate the European market. He says that the current installed base in Europe is some 50 systems, though the growth rate has recently started to grow exponentially.

Reisdorf is now launching a new company, Microland, that will handle distribution for a wide range of systems, including Alpha Micor, Cromemco, and a Dutch company, Bristech, that was "discovered" by Data Precision, and is being handled by it in the UK.

Intel extends the 8086 range—and plans for Pascal and Cobol

ON a flying visit to the UK last week, Dave House, marketing manager for Intel's microcomputer components division in Santa Clara, California, spoke about some of the new developments that can be expected over the next two years to extend the capabilities of the 8086 16-bit microprocessor.

In addition to a new maths processor chip, the most notable of these developments is in software. The company has changed direction from its position last autumn. Then software product manager, Mike Kane, said that Intel had little interest in the rise in popularity of Pascal as a high level language and that the company had no plans to introduce a version of it for the 8086. There were also no plans to support Cobol (CW, October 26, 1978).

Now, according to House, Intel is committed to producing Pascal for the 8086. The language should appear probably within a year, and within 18 months at the outside.

Plans also exist to provide support for Cobol, although no set timescale yet exists for this development. House said that the Cobol planning was still being worked on, and hinted at the possibility of an outside software house being brought in to produce the language to the company's specification.

He also announced a price reduction on the two versions of the 8086 already available. The 5MHz part has had 23% lopped off its price, bringing it down to £48.57 each in 500-up quantities, while the 4 MHz version has been reduced by 21%, bringing its price down to £41.53 each in 500-up quantities.

The maths processor chip, which as yet has no quotable type number, will be joining the 8 MHz version of the 8086, the 8088 8-bit bus compatible version of the processor, and the 8089 I/O processor, all of which are scheduled to appear over the next year (CW, November 24, 1977 and January 11).

According to House, the new maths processor extends the 8086's performance in arithmetic operations by about 100 times, without changing any applications software. Unlike the Advanced Micro Devices' 9511 floating point maths chip, which is a slave processor, the new Intel part will be a co-processor with the 8086.

This, House explained, meant that it would share the bus with the main 8086 CPU in a system and operate directly with it, providing, in effect a dedicated maths-oriented extension to the 8086 instruction set.

He also alluded to two future developments of the 8086 processor, giving them both the pseudonym of 80XX type numbers.

One he called a highly integrated system processor, which he expected to be introduced by mid-1891. Though House would not admit it, it seems likely that this is the rumoured single chip version of the 8086, which will have ROM, RAM and I/O on board (CW, January 11).

The other he referred to as a higher performance system processor, which might well be the new 16-bit processor Intel is rumoured to be developing (CW January 11). The type number attached to this rumoured part, 80000, is now understood to be 10 times less – 8800.

Questions on the growing competition in the 16-bit micro market elicited some interesting responses from House, as he listed the companies he sees as being major competition.

The biggest threat to Intel, he felt, would come from Mostek, which last year took out an official second source agreement for the 8086 (CW, November 23, 1978). They would be closely followed by a group of other, unspecified companies, which are currently working on "reverse engineering" the part unofficially.

As for the other types of 16-bit processor around or coming up, he saw less threat. Texas Instruments, for example, with the 9900 part, was not seen as a real competitor, even though the company could never be discounted in the semiconductor business.

On the Zilog Z8000, he felt there was a chance that the company "might miss the window", if it did not introduce the 2-chip, 8 Mbyte addressing system by mid-1980.

Zilog is known to be going through a design iteration on the first version of the chip, which has only 64K bytes addressing, and is not expected to ship fully characterised samples until the middle of the year.

House felt that the specified architecture of the Motorola 68000 was impressive, and the device could be noteworthy. However, he suggested that it would require a very advanced and complex production process to manufacture the chip, hinting that it might even be beyond the capabilities of Intel's own HMOS process at present.

The implication of this assumption is that the die size of the 68000 may either be very large, and therefore difficult to make in volume, or that Motorola may have to tone down the specification of the part.

On devices like the Fairchild Microflame processor, which emulates the Data General microNova instruction set, House said that he did not see them as big competition. As he put it, Intel produces as many processors as the total installed base of minicomputers every two to three months.

Byte Shop grows

A PRIVATE London College will use a micro-based time sharing system to teach programming in Extended Basic. The £9,000 system is a Cromemco System 3 supplied by the Byte Shop in Ilford, and includes three teletypes and a VDU, a dual minifloppy disc drive, 16K bytes of static RAM for each of four users and 48K bytes of RAM for the system software.

The System 3 is based on a Mostek Z80A microprocessor running at 4MHz, and can be expanded to support up to seven VDUs with 32K bytes allocated to each.

The Byte Shop is to open another London branch in Tottenham Court Road, and other branches are planned for Manchester, Birmingham, Leeds and Glasgow.

A Nottingham branch has also been opened, under the managership of ex-IBM man John Braga, and it will also be the dealers in the Midlands for the ITT 2020 microcomputer system.

Ferranti's new converters

TWO new converter chips have been introduced by Ferranti Electronics specifically for use in microprocessor-based systems.

They are the ZN 427 successive approximation D-A converter, and the ZN 428 latching D-A converter. The ZN 427 is a microprocessor compatible 8-bit unit, suitable for use with distributed processing systems. Housed in an 18-pin package, it incorporates a 2.5 volt precision reference, and successive approximation logic with three-state outputs for data bussing.

The ZN428 contains multiplying D-A with direct voltage output, latches, and a 2.5 volt precision reference. It is housed in a 16-pin package.

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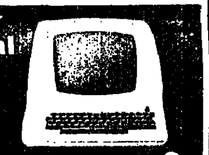

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TIM PALMER PROVIDES THE ANSWERS ON IBM's NEW MAINFRAMES

Twenty questions on the 4300 Series

● **What is so new about the 4331 and 4341?**

Price-performance is the most obvious difference between the new machines and the 370s they replace. A 4331 has a million instructions per second, MIPS, rating of up to 1.3 times that of the 370/135 or 0.94 of the 370/138. The 4341 is rated at up to 1.7 times a 370/148. Overall, the price-performance improvement over the comparable 370s is between four and seven times.

● **What about the memory?**

The 64K-bit MOSFET memory is priced at just under £10,000 per Megabyte. With first deliveries in the April-June quarter, the 4331 will be the first machine with 64K chips installed by any manufacturer.

● **What is the technology of the processor chips?**

Bipolar TTL with 704 devices per chip. (Details are given in Micro News, November 2, 1978.

● **What does this mean to the user?**

It contributes towards the reliability of the processors. IBM believes that they will prove so reliable that there will be no need for routine processor maintenance.

● **What else is special about the new machines?**

The 4331 is the first mainframe-class machine available in configurations that can tolerate a non-air-conditioned office environment. The first mainframe processor to offer this was the Digital Equipment DECsystem-2020. However the discs on the 2020 still need air-conditioning, whereas the new IBM 3310 64 Megabyte non-removable discs for the 4331 do not.

● **Who are the 4331 and 4341 aimed at?**

The 4331 is for "new users" and is also a possible 370/115 upgrade. It can act as either an SNA network host or node, and is also suitable for installation at multiple sites in a network around a larger 370. The 4341 is an upgrade for 370/125, 135 and 138 users.

● **How does one choose between the 4331 and the 8100 distributed processing system?**

The 8100 is the more attractive for users with a large very competent development staff, and in cases where identical applications are required at several sites. The 4331 is more attractive where a varied local data processing workload is to be run at a number of sites.

● **How does one choose between the 4331 and the IBM System 38?**

The database facilities (basically DL/1) on 4331 are less attractive than the relational database on the System 38, but the 4331 is the entry into a path which leads all the way up to (at present) IMS under OS/VS1 and MVS, and probably to a completely new large-scale database system. IBM DPD also points out that the System 38 is the top of GSD's line, offering no growth path. That is not to say that there will not be a System 40 from GSD in a year or two.

● **How do the new machines fit in with Systems Network Architecture?**

The 4331 has an optional integral communications adaptor which, together with a new software package ACF/VTAM-E includes substantially all the functions of the Network Control Program normally resident in the 3705 front-end processor. It can thus act as an SNA node or an SNA host — and the cost of the processor and adaptor is about the same as a 3705.

● **Why is this communications adaptor not offered with the 4341?**

IBM points out that the communications adaptor uses up some of the processor capacity of the 4331, and says it decided that 4341 users would want to dedicate their CPUs entirely to productive processing. 4341 users therefore still have to attach a 3705 if they want to use the machine as an SNA host. The channel-channel adaptor on the 4341 cannot support the optional slower channels on the 4331 either.

● **What are the operating systems on the new machines, and how does one switch between them?**

The 4331 runs in three modes: 370 mode; VM mode with Extended Control Program Support, ECPS, giving up to 80% better performance than 370 mode under VM; and DOS/VSE with ECPS. The microcode for each mode of working is permanently held on a floppy disc within the machine, and the usual Initial Program Load at the start of the day is accompanied by Initial Microcode Load.

Operating systems for the 4341 are VM/370, DOS/VSE and OS/VS1. IBM regards the 4341 as a "VM 370" machine, and recommends that DOS/VSE on all machines over one Megabyte, and OS/VS1 on all machines over two Megabytes be run under VM/370. VM is more attractive in native mode following enhancements to the CMS Conversational Monitor System time sharing facility, which for example enable different CMS virtual machines to share the same files. (For a more detailed non-technical rundown on VM/370, see Computer Weekly, July 6, 1978.

● **What is DOS/VSE?**

A new release of DOS/VS sufficiently enhanced over Release 34 to justify the change of name. DOS/VS is essentially a batch operating system. The most important enhancement is the addition of a new time sharing option called ICCF, Interactive Computing and Control Facility, to enable users to develop programs online from terminals. It is specifically for use on the 4331 running without VM; under VM, DOS/VSE users switch to CMS for program development.

● **Will the new operating system releases run on 370s?**

Yes, and IBM expects 370 users to adopt them. There are, of course, penalties: DOS/VS occupies 96K bytes of store; DOS/VSE takes 160K bytes. The ECPS microcode for VM/370 and for DOS/VSE is not available on existing 370s, although there is a similar assist on the 138 and 148. Performance improvements achieved by ECPS vary from [illegible] 20%, and additional functions in the new releases give another [illegible] improvement, which will [illegible] 370 users.

● **What about MVS?**

MVS will "probably [illegible] under VM on the 4341, but [illegible] not supported. That means [illegible] if a user runs into trouble, [illegible] have to pay over and above [illegible] normal support contract [illegible] software engineer from IBM [illegible] come and sort it out. IBM [illegible] that MVS remains the [illegible] top-end operating system.

● **After all the speculation, [illegible] IBM unbundled?**

Yes and no. The operating systems are still available [illegible] out charge, but IBM is [illegible] keting them packaged [illegible] licensed IPOs, Installation Productivity Options, known [illegible] 4300 as IPO/Es. IPO/Es [illegible] the operating system and [illegible] lection of ancillary licensed [illegible] gram products selected by [illegible] user on a menu basis, and [illegible] by IBM as a package before delivery to the customer. [illegible] cheerfully confesses that [illegible] users may have the operating system without the [illegible] IPO/E, they are unlikely [illegible] able to get the operating [illegible] up and running.

● **How much, then, do [illegible] IPO/Es cost?**

It varies according [illegible] number of licensed p[illegible] included, but typically [illegible] dicated VM machine, it's £643 a month; and for D[illegible] under VM, £1,500 to [illegible] month. For VSE alone [illegible] be anything from about [illegible] month to over £1,20[illegible] CICS/VS and datab[illegible] communication softw[illegible] cluded. Software could [illegible] represent typically 30[illegible] value of an installation.

● **What is the significance [illegible] the new method of so[illegible] support for DOS/VSE, [illegible] OS/VS1 and selected p[illegible] products?**

The significance to the [illegible] the cost. What it means [illegible] where a software problem [illegible] was previously solved by [illegible] engineer paying a site [illegible] now be solved over [illegible] telephone, the cost to the [illegible] will be no greater than [illegible] be. Where however a site [illegible] necessary, the user will [illegible] pay a new additional charge.

● **How will it work?**

IBM is setting up a new [illegible] ware Support Centre for [illegible] in Birmingham. Users [illegible] tering a software problem [illegible] first telephone the centre [illegible] give details of their identity [illegible] problem (it is not yet [illegible] who will pay for this [illegible]. They will then get a call [illegible] from an appropriately [illegible] engineer, and IBM believes [illegible] 65 to 70% of problems [illegible] solved in this way.

● **What happens if the [illegible] is not forthcoming?**

A regional or local [illegible] engineer will make a [illegible] visit. Users may pay [illegible] either on a per-call [illegible] under a new monthly [illegible]

● **Who benefits?**

There is one [illegible] the user: the national [illegible] be staffed by the top [illegible] the field, who will have [illegible] access to the Retain [illegible] which maintains [illegible] problems encountered [illegible] the world, and of the [illegible] fix.

The benefit to IBM [illegible] enhanced productivity [illegible] support service [illegible] the fact that the 4300 [illegible] first mass-market machine [illegible] DP Division and IBM [illegible] afford to support [illegible] way as it has supported [illegible]

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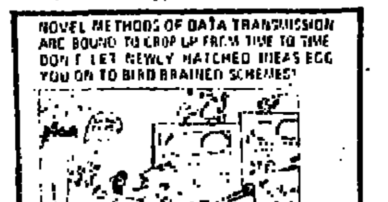

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US sets out seven principles for national information policy

A COHERENT national information policy for the US, lack of which has long been the subject of comment and complaint, is now much closer, following the formulation of seven basic principles for the policy. These include: open access to government information; encouragement of effective management of information; encouragement of fairness in the distribution of information as well as efficiency; and fostering of competition in the market.

These ideas were outlined by Henry Geller, head of the National Telecommunications and Information Administration, who said they were the first fruits of a year-long project to define the basis of information policy. Later this spring a report will be published giving details of the seven principles and showing how they relate to specific issues such as electronic funds transfer, libraries, and cross-border data flow.

After the four mentioned above, the remaining principles are:

Privacy: "Information about individuals should not be recorded without their knowledge and consent and, when recorded, should not be stored, used or disclosed unfairly";

The encouragement of the production of information on goods and services. The government should play a "significant, affirmative role" in this;

International concerns: "The US must take account of the views of many other countries about information and must recognise that they frequently do not share the same information policy assumptions as the US."

Arthur Bushkin, director of NTIA's Information Policy Programme, said, "There is an intellectually coherent set of ideas here that have to be tied together."

INTERNATIONAL BRIEFING

Nippon first into China

JAPANESE computer companies are not going to leave the embryo Chinese computer market to the Americans and the French, and Nippon Electric has already scored a couple of hits across the Sea of Japan.

A mid-range ACOS 77/300 mainframe, based on CII-HB Level 64 licences, is on its way to the Shanghai External Trade Bureau, and NEC will also score a significant first following a request from the Chinese Data Communications Research Institute.

An ACOS 77/500, architecturally similar to Level 64 but above the performance of any of the French-built machines, is to be installed at the institute.

R2E banking move

NOW 60% owned by CII-HB and beneficiary of considerable additional investment, French microcomputer pioneer R2E has moved into the banking terminal market. The new product, called the Mercure, comes with [illegible] character [illegible] display [illegible] character [illegible] cheque reader, [illegible] packet-switched network interface; floppy or hard discs, and is priced at between 45,000 and 65,000 francs.

Belgian profits

THE Belgian subsidiary of ICL has reported a profit of BF 29.8 million, £510,000, on turnover up 13% at BF 365.8 million, £5.7 million, for the year to September 1978.

User group

USERS of Systems Engineering Laboratories computers all over Europe are now being invited to join a user group that has been set up independently of the supplier. More information about the group can be obtained from the president of the group, C. Jussiant, Ingénieur Chef de Service, Unerg, Rue Puissant, 16, B-6000 Charleroi, Belgium. Tel. 010/32/71/322307.

STC grows

CONTINUING to expand at a very fast rate, Storage Technology Corp, manufacturer of IBM compatible peripherals, has reported a turnover of more than $300 million for its 1978 fiscal year, 85 per cent up on 1977. STC's outright sales more than doubled to $220 million, while net profits, at nearly $27 million, were 135 per cent up on 1977. STC's shares are now third in the US growth stock league.

Students sentenced

TWO Canadian students who used a university computer by remote terminal without permission have been given one-year suspended sentences for "theft of telecommunications services" by a federal court in Edmonton. Prosecutors decided on this charge because there was no federal statute outlawing the theft of computing services.

IBM hits back by cutting French investment

FEARS expressed in France that IBM is about to cut back new investment there, are bolstered by the announcement that the first two models of the IBM 4300 series will be built in West Germany.

The IBM decision could also be regarded as a warning shot across the bows of the Italian government since the 4331 [illegible] and the 4331 is targeted at the same market as the Italian built 370/115 and 125.

French concern over future IBM investment there arises from the fact that government preference for the national majority-owned mainframe company CII-Honeywell Bull, has seriously unbalanced IBM's trading position in France vis-à-vis the rest of Europe.

The 3031, 3032, 370/138 and 3750 telephone switching system are all built in France, and the value of exports of these products to the rest of Europe is no longer counterbalanced by comparable imports of IBM products to France.

Although IBM regularly broadcasts its local export figures in each country where it manufactures, it never reveals the value of local imports. In fact it tries to maintain a small positive balance of trade in all the major countries where it operates.

However the balance [illegible] point where the German subsidiary and to a lesser extent those in the UK and in some smaller countries are in a strong position to demand that any new investment goes to them rather than to France.

Last year, Jacques Lemonnier, the new managing director of IBM France complained about the slow growth in IBM's public sector business in France (CW, June 29). Since then, the French government has announced a new "Plan Calcul" for the development of the national computer industry intended to help local companies to compete more effectively with IBM.

It now appears that IBM is ready to retaliate by redirecting new investment away from France.

Although IBM France will not comment on its local plans, it does nothing to discourage speculation that it is prepared to retaliate if government business there does not pick up.

[illegible] in all European countries where IBM had manufacturing plants it tried to ensure that local investment was in proportion to the amount of business done in that country.

IBM has also suffered at the hands of the Italian government. So far, two ministries — the Treasury and the Finance Ministry — have replaced large IBM mainframes with Amdahl 470s. With four Amdahl 470s installed and more on the way, the Italian government is the first to make a major investment in large IBM-compatible mainframes.

The decision to build the 4331 in Germany could be a reflection of this. IBM has suffered less from protectionist government policies in Germany than in any other major European country.

Meanwhile, US reports suggest that IBM would like to build the 4300 series in Brazil following that country's indication that it may be prepared to relax strict regulations prohibiting 100 per cent foreign-owned companies manufacturing computers there. Burroughs, Univac and CII-HB are also said to be interested in Brazilian manufacture.

A great leap forward in processing power has turned Asian Computer Services Ltd into one of the biggest bureaux in Singapore. The company, a subsidiary of the Haw Par Brothers trading company, has replaced its IBM 370/115 with a $1.5 million 370/138 with the aim of adding many new clients to its present roster of 50. Under 10% of the bureau's $1.2 million annual revenue comes from Haw Par.

Ireland plans to train 400 programmers a year

IRELAND'S serious shortage of computer staff has led to the setting up of a Computer Industry Joint Education Committee, which aims to devise a plan to train 400 new programmers a year. On a longer term, it will formulate a national education policy for the computer industry.

The committee is a joint effort of the Irish Computer Society, the manufacturing and services trade associations, and the Irish Federation of Computer Users. Members include Tom Byrnes, managing director of IBM Ireland and Sean Boyle of consultants Arthur Anderson. The chairman is Alan Mulally of the ICS.

The Confederation of Irish Industry is also involved, and the Department of Economic Planning and Development is awaiting the outcome with interest.

Nixdorf may enter plug compatible market

A SUGGESTION that Nixdorf may be planning to enter the IBM plug-compatible mainframe market with mid-range processors imported from the US, is described by the company as "based on speculation," and a spokesman for Nixdorf in Paderborn declined to confirm it.

According to the German weekly Computerwoche, possible partners for Nixdorf are either Control Data with the Omega 480, manufactured by IPL Systems of Waltham, or Cambridge Memories of Bedford, Massachusetts.

Nixdorf is already associated with Control Data in the Stack components standardisation and procurement company, in which ICL, Plessey and Olivetti are also involved.

Evidence for Nixdorf's move into the IBM plug-compatible business includes the hiring of several IBM salesmen, and a statement by Heinz Nixdorf a couple of years ago that his company would be in the IBM-compatible market by this year.

US govt could force IBM to disclose long-range plans

THE US Justice Department's anti-trust suit against IBM is now 10 years old, and US observers believe it could drag on for another decade.

Latest development is a massive new demand for information from the Justice Department which, if allowed by the court, could force IBM to disclose many of its highly confidential long-range plans in both the computer and communications businesses.

The Justice Department believes that actions by IBM helped force both General Electric and RCA out of the mainframe business, although both companies deny this. It also believes that peripheral manufacturers like Telex and Memorex were severely hurt by IBM retaliation.

First of the Fujitsus

The first Fujitsu M-series mainframe taken by Siemens under its agreement to market the large-scale Japanese computers in Europe is now installed at Perlach, south-east of Munich. Perlach is to be the base for Siemens' software development, and will also offer customers a time sharing service.

Siemens is to market the M-200 and the M-180 from Fujitsu as the Siemens 7.800 line, running under Fujitsu's OS4/F1V operating system, renamed BS3000 for European consumption. The operating system is claimed to offer the same user and application program interfaces as IBM's MVS.

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MARKETVIEW

BY FRED LAMOND

Fresh look at PTT's telecoms monopolies

Shortly before the end of 1978, the UK National Committee on Computer Networks published its report. The committee's 17 members included four top level government administrators and a further four executives of state-owned corporations, including the Post Office. Yet, with only the representatives of the Post Office and of the Post Office Engineering Union dissenting, the committee made some startlingly radical recommendations to relax the Post Office monopoly hold over equipment that can be attached to the public switched telephone network, on the provision of value-added services such as message switching, and suggested the removal of restrictions on the interconnection of private leased line networks with the public network.

In this Marketview, FRED LAMOND examines the historical background to current PTT monopolies in Europe, and the technological developments that are now forcing these to be reassessed in other European countries as much as in the UK.

PUBLIC switched telecommunications facilities are state monopolies in all European countries, although patterns of organisation differ.

A small part of these telecommunications monopolies is "natural", ie determined by the nature of the service itself. This includes the provision of local exchanges within contiguous urban areas, the junction lines between these exchanges, and the lines from these exchanges to individual subscribers' premises.

Unlike North America, however, European telecommunications monopolies go well beyond the boundaries of this "natural" monopoly. They include the provision of long distance and international trunk circuits, although the multiplication of trunk carriers required by telecommunications traffic between the main metropolitan areas, and their increasing diversity allow a measure of competition.

European monopolies also embrace the provision of private leased telegraph, telephone or wideband circuits that pass over the public domain, and the provision of value-added multiplexing, packet or message switching services on leased or switched telegraph and telephone lines. The authorities also have the power to regulate the types of devices that may be connected to their public switched networks.

The British, Scandinavian, and Swiss PTTs use this regulatory power to impose a monopoly on the provision by themselves of all line attachments to the public networks and such private leased lines that may interconnect with them. So does the West German Federal Post Office for modems used to connect digital data terminals.

The motives behind European PTTs' insistence on such all-embracing monopoly powers — and behind North American telephone companies' desperate attempts to get back to a similar situation by sponsoring Congressional legislation — are not unworthy. They are closely linked with all telephone engineers' and administrators' ideal: "universality" of service, "a telephone in every home."

The cost of connecting many outlying farms and houses to the public network might well be beyond their owners' means, if the PTTs charged it to them in full. All PTTs therefore subsidise telephone installation costs to a greater or lesser extent.

They have to recover this installation subsidy somehow, and their preferred medium is the call charge. Telephone subscribers thus pay in proportion to their use of the system.

To offset the subsidy on installation costs, call charges must be correspondingly higher than the incremental cost to the network of each call.

A supplier can only engage in such "functional" pricing, however, if he is in an effective monopoly situation. In any competitive environment, charges are soon pushed down to no more than a normal profit margin above marginal incremental costs.

It is because they rely so heavily on call charge revenue to subsidise installation costs, that European PTTs dislike the provision of leased lines, on which rentals are distance and quality dependent, but not usage dependent.

Although the charges for such lines are high, PTTs feel that their use somehow "cheats" them of call charges.

Leased lines may only run between premises owned by the same company, or group of majority owned companies, except in exceptional circumstances for special purpose networks such as the Sita air reservations system, and the Swift international inter-bank transfer network. Even then, the leased line user may only use it for his own intra-company traffic, or for the special purpose for which the network was authorised.

The only exceptions to this prohibition on the interconnection of private leased lines with the public network have been the British Dataplex and French Transpac services, that allow the clients of commercial time sharing services, or the remote offices or factories of a large company, to ring a local concentrator node at short distance charges, to transmit data to their national centre.

The equipment monopolies exercised in the UK, Scandinavia and Switzerland are an extension of the same principle. The provision of a ubiquitous and efficient engineering service to telephone subscribers is seen as an essential part of a universal telephone service. The spread of overheads over all subscribers, allows a lower cost of maintenance to each.

If PTTs allow free attachment of any device of a subscriber's choosing to the telephone network while insisting on maintaining it, their investment in stocks of spare parts for all the devices would soon grow out of all manageable bounds.

Thus a monopoly on the provision of maintenance services leads almost inevitably to a monopoly on the provision of the attached devices themselves.

The only alternative is to restrict the number of choices open to the user by means of type approval. This is the method preferred by the French and West German PTTs among others, and by the British Post Office itself for PABXs with more than 100 internal extensions.

As long as the telephone network was used for point-to-point business, these restrictions on line attachments and the interconnection of private and public networks were at worst irksome to a very small number of large business users.

Now, however, we are approaching a time when the use of stored program logic in the form of microprocessors in minicomputers, as well as broadband transmission media such as communications satellites and fibre optic cables, will lead to an increasing convergence of telecommunications with TV broadcasting and computerised data processing.

In this rapidly changing environment, there is a grave danger that the manner in which European PTTs currently exercise their monopolies will hamper technological advance by the European computer and telecommunications industries. This in turn could cause them to lose international market share to less the inhibited American and Japanese.

In this new multi-purpose "telematic" environment, services attached to both analogue and the digital telecommunications networks will not be confined to audio handsets or teleprinters.

They may include any possible combination of loudspeaker and receiver, keyboard and/or alphanumeric keyboard, single or multiline alphanumeric or graphic display screens, impact, matrix inkjet or electrostatic serial or line printers, OCR or facsimile document readers, all under the control of one or more programmable microcomputers with different sizes of main memory and auxiliary local file backing storage.

How could European PTTs possibly decide in advance which combinations will meet the needs of most of their users best? Only the users themselves can decide this, if they are offered a free market choice.

To be fair to them, European PTTs saw the problem looming in the mid-Sixties and thought that they had solved it with the modem boundary concept. Whenever equipment is interfaced via a modem to a public line, it is the modem which counts as the "terminal equipment" to which either PTT supply monopoly or approval applies.

This compromise was workable with mid-Sixties technology, but since then the pace of change in the semiconductor industry has made possible to implement more complex high performance modems on a single semiconductor chip costing only a few pounds, and to incorporate them in the terminals themselves.

Under present European PTT rules such integrated terminals are not allowed.

The UK National Committee on Computer Networks has called for a relaxation of Post Office monopoly over attachments. This has already been done in the case of private viewdata terminals, which will be allowed to interface with approved modem cards. In the case of domestic TV sets, at least, these may be marketed by TV rental companies and private electricians.

But this makes the Post Office's continued insistence on separate exchange line modems for other types of terminal used by business and light industry illogical and unfair.

The convergence of telecommunications, automatic data processing and computer

● Turn to page 3

Fred Lamond

● From page 16

lead not only to a proliferation of different types of terminal equipment, but also of the uses to which they can be put, and the "value added services" that can be provided.

Packet switching networks are only one of many types of value added service, and the one closest to the PTTs' traditional message transmission functions. Store and forward message switching services are another type.

Such value added services require an additional investment of capital, to pay for the required hardware, software and staff. Not all of them will meet a level of demand sufficiently high or urgent to enable them to be profitable, and PTTs cannot be expected to provide them all.

But if the PTTs do not want to risk the capital to launch a new type of value added service why should not private entrepreneurs be allowed to do so? The users of their services would be the prime beneficiaries. That is why the National Committee on Computer Networks recommended limited licensing of a number of competitive message switching and other value added services for an experimental period of 10 years.

Finally, interconnection of private leased line networks and the public switched telecommunications networks would allow a more rational use of scarce long distance trunk channel resources.

In the UK, all these recommendations to relax the Post Office monopoly were opposed by the Post Office Engineering Union representative on the network committee, and it is easy to see why. At a time when the gradual replacement of electro-mechanical Strowger switching exchanges is leading to a sharp reduction in maintenance work required, the union does not want its members to lose any of the work that they now carry out at subscriber sites.

But that is taking far too gloomy a view of the consequences of such liberalisation. A relaxation of the equipment monopoly, for instance, does not mean that the Post Office and other European PTTs would have to withdraw entirely from either the supply or the maintenance of line attachments.

They could compete with private suppliers for the supply and maintenance not only of handsets and modems, but also of all the different types of terminals from the supply of which they have excluded themselves.

Their engineers would thereby gain far more maintenance work on digital data and integrated terminals than they would lose working on PABXs and present equipment.

If the post offices further broadened their activities to offer their services as third party maintenance services for the main computer and terminal ranges, they would be opening up the computer market to more competition, instead of preventing the telecommunications market from innovating and expanding.

And the more competitive the European computer and telecommunications industries are, the faster they will be able to expand their turnovers and the jobs they have to offer.

FCC is asked to reject AT&T's new venture

BECAUSE AT&T's proposed Advanced Communications Service is predominantly a data processing service, it should be rejected by the Federal Communications Commission. This is the case being made by the Computer and Business Equipment Manufacturers Association in a submission to the FCC.

According to CBEMA, the AT&T venture is seen as "the sheerest attempt to ignore the FFC rules and definitions, and to mask the true nature of the service by use of communications terminology where the net result would include an unprecedented extension of regulation into the presently competitive marketplace for data processing services."

CBEMA said it is convinced that ACS offers predominantly DP services to the public. That conclusion was reached, the association explained, because the bulk of ACS services involved extensive storage and manipulation of data unrelated to the transmission of an addressed message through the network to another terminal or host.

In addition, CBEMA said it believes that the AT&T argument that ACS will not be used for DP services has no merit. Any parts of ACS that, standing alone, might be permissible as communications services are so interwoven with predominantly data processing features that the entire proposal must be rejected as a DP service.

CBEMA was particularly irritated by AT&T's use of communications terminology in its descriptions of ACS when DP terms were more appropriate. "There are vital features proposed by ACS which require the recording of databases characterised by AT&T as stored messages and provide retrieval or manipulation of the data in the messages according to programmed instructions stored within ACS and prepared by the customer or by the carrier. These services have little or no relation to moving an addressed message through a network to its recipient — the primary characteristic of a communications service.

"Rather," the statement continued, "the utility of the message services to the customer depends on tailored programming and stored data, the hallmark of data processing services. They are nevertheless — and for obvious reasons — denominated 'message' services rather than the database management and data processing services that they are."

In another instance, CBEMA cites features of ACS that allow an interactive exchange between a terminal and the network as evidence of its contentions.

The CBEMA adds, "While some of these features have been permitted as adjuncts to the communications services provided by other carriers, the call services of ACS are inextricably interwoven with tailored customer programming and the message services, such that both form predominantly data processing offerings."

The trade association concludes that the FCC "should make clear that the use of stored messages or network capabilities for data processing applications that are unrelated to the primary communications purpose — moving a customer's addressed message through a network to its recipient — cannot be allowed as a tariffed offering."

CBEMA is not alone in its request that the FCC deny AT&T the right to offer ACS as it has been proposed. The Computer and Communications Industry Association has also filed a brief with the FCC asking that AT&T's petition be denied.

CCIA, like CBEMA, believes that ACS will be a computing service, and that as such it cannot be offered by AT&T. CCIA describes the proposed ACS facility that enables users to manipulate messages within the ACS system as data processing.

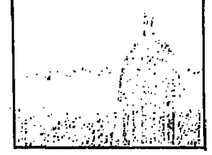
CCIA asked the FCC to restrict AT&T's offering to a packet switching service, which it believes falls within the scope of the law. And even if AT&T should alter ACS to meet CCIA's suggested scope, the CCIA believes ACS should only be offered through a separate subsidiary of AT&T.

While the two industry groups, CBEMA and CCIA, hope that the government will ban or at least restrict AT&T's offering of ACS, Digital Equipment Corp, America's largest maker of minicomputers, favours the Bell System proposal for a nationwide communications net.

In DEC's opinion, ACS is a communications service, and one which will solve the compatibility problems users face.

DEC also said that the ability of ACS to translate among various data rates, data representation methods and communications protocols will foster competition.

WASHINGTON REPORT BY CAMERON DAVIS



Telenet contract

TELENET Communications Corp has won a $4.5 million contract with the US Department of Agriculture.

Under the contract, Telenet's nationwide packet network will interconnect four USDA computer centres and 000 data terminals at approximately 300 US locations.

Principal users will be the US Forest Service, the Farmers Home Administration, the Animal and Plant Health Inspection Service, and the Science and Education Administration.

Congress on China's DP needs

ALTHOUGH the electronics industry of mainland China has progressed rapidly in recent years, shortcomings remain in product quality and technical sophistication, according to a report to the US Congress.

Entitled "The Chinese Economy Post Mao," the report was released by the Joint Economic Committee shortly before the official establishment of diplomatic relations between the US and the People's Republic.

"Most of China's computers are one-of-a-kind or batch assembly items developed independently at a number of research institutes and production facilities," the report states. It adds that installed computers "are clearly inadequate in numbers and capabilities to meet military and industry needs or to train sufficient personnel in computer applications."

At the same time, electronics production tends to lag 10 years or more behind the state of the art in terms of embodied technology.

The answer for China, the report states, is to continue to import electronics if the country hopes to acquire "basic expertise in all areas of production."

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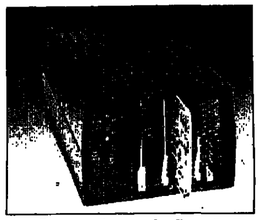

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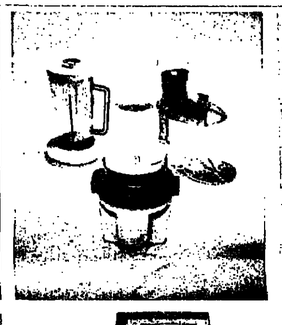

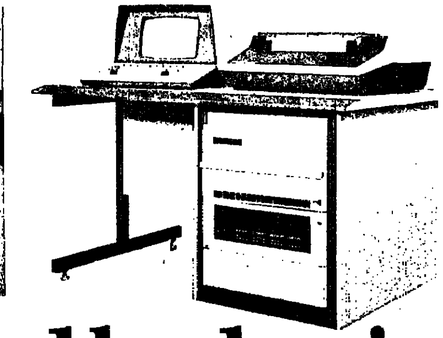

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AT&T's winter retreat from Iran to Moscow

AMERICAN Telephone & Telegraph, the largest US communications company, has suffered disruption of a major project in Iran due to the political turmoil there.

At the same time another branch of the company hopes to get a contract to supply the Soviet Union with a huge telecommunications manufacturing factory.

Hundreds of AT&T employees have been sent back to the US, according to a spokesman for American Bell International, a wholly-owned subsidiary of AT&T set up to provide know-how to the Iranians.

ABI was hired in August 1975 to fulfil contracts totalling $194 million. These contracts include planning a modern telecommunications plant for Iran, making short-term improvements in the existing telephone service, beginning a number of engineering projects with a view towards modernisation, and reorganising the existing telephone bureaucracy.

ABI was initially hired by the US government under a foreign military sales contract, executed through the US Air Force. In 1977, ABI began working directly for the government of Iran, and in that year increased its revenues from $31 million in 1976 to $60 million.

Through ABI, Iran had awarded more than $1,000 million in contracts for telecommunications equipment. In addition, the Iranians were preparing to launch a satellite named Zohreh, the Persian name for Venus, via the American space shuttle.

It is not known how much of the equipment purchased by Iran under ABI's management came from or would have come from other AT&T divisions.

Meanwhile, on the other side of the Caspian, AT&T's manufacturing company, Western Electric, is hoping for a $200 million contract to build a factory for USSR to make telecommunications switches.

According to US reports, confirmed by a Western Electric spokesman, it will be competing for roubles with ITT, the French firms Thomson-CSF and CIT-Alcatel, Sweden's Ericsson and Japan's Nippon Electric Company.

NEWS FROM AMERICA BY HESH WIENER

US economy faces bad year

LEADING economists at one of Wall Street's most prestigious firms have predicted a difficult year for the US economy and severe strains on businesses requiring capital.

Henry Kaufman, of Salomon Brothers, led a team of experts to produce a study of future trends. US financial markets, said the report, "will reflect an economy struggling to maintain headway against the burden of near record inflation rates and cumulative monetary restraint."

This is the result of the weak dollar and "government follies," said the experts, and will probably cause the US gross national product to fall. The decline is expected late in 1979, following a period of slow economic growth.

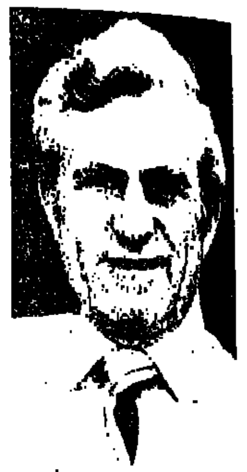
Kaufman and his colleagues predict that businesses will experience their first decline in internal cash generation since 1974, when the last US recession occurred. (This was triggered by the sharp increase in oil prices compounded by the sale of large amounts of US grain to the USSR and clumsy government policies.)

The combination of recession and tax cuts will also diminish Washington's income. The report predicts that US Treasury borrowings will increase.

Compared to 1978, it is predicted that foreigners will contribute less new capital for the US, adding to the problems.

The various pressures on the money supply will result in continuing high interest rates in the US and the "prime loan rate will exceed the previously unprecedented 1974-75 highs."

Recession fears are 'no threat'—Amdahl



DR GENE AMDAHL, founder and chairman of Amdahl Corp, foresees an excellent year ahead for his company, despite threats of a recession and the likelihood of increased competitive pressure from IBM and other plug compatible computer makers.

Amdahl recently cut the prices it charges for its equipment, bringing memory costs into line with those currently charged by other leading mainframe makers.

The drop in prices has been about 9% but it is unlikely that the lowered prices will result in diminished profits. Amdahl Corp has recently shifted its memory manufacture from 4K chips to 16K chips, a move that cuts assembly costs substantially.

"We're rather insensitive to recession," said Dr Amdahl. "I think most of the computer industry is, because it offers one of the few ways of improving productivity."

One threat posed by the expected announcement of new large mainframes by IBM is less easy to counter, however. "The marketplace might go dormant for a while," Dr Amdahl pointed out, "while people wait to see what it really is that IBM has."

Amdahl had been also concerned that hesitancy on the part of customers would follow the announcements of 303X machines; but no lag in Amdahl Corp sales actually resulted from that series of new product offerings.

In addition to pricing changes, Dr Amdahl also believes his company can upgrade system performance and increase the functions the 470 series can perform. Such upgrades might be more difficult for the older machines, as they would be for systems made by any manufacturer.

Even though the early Amdahl computers may not be subject to upgrades, Dr Amdahl has reason to believe that they will have high residual values. The simpler cooling requirements of the 470 computers, compared to 370 or 303X machines, and the compactness of the Amdahl machines are the basis for this belief.

"The 168 takes a lot of space. And you have to put in water cooling which, with a used machine, becomes a bigger and bigger percentage of its worth."

He expects IBM to continue to use water rather than air to dissipate the heat of its large computers because IBM is locked into certain assembly techniques.

The automatic machines used to make IBM mainframes are designed to use a particular type of component packaging, and that packaging, combined with dense, high-speed logic, produces heat that cannot be dissipated by an air cooling system. This situation is likely to remain static, at least for the near future, in Dr Amdahl's opinion. I don't think they have addressed the problem (of new component packaging) early enough to affect planned mainframe offerings."

But IBM has become a more aggressive competitor of late and has forced other computer companies to move faster than ever before. IBM's introduction of new products with better pricing and enhanced performance places financial demands on companies that want to keep up the pace.

Amdahl Corp appears to be wealthy enough to weather the storm of innovation. "We've been in a state of positive cash flow of the order of $100 million. When you consider we only did a little over $300 million in revenues last year, that's not a bad cash position."

One area of great success for the company has been the reception of its products abroad. "Canada has been a gold mine for us, and the plant in Ireland promises to make European sales more profitable and easier to support."

The Irish plant has delivered "nearly a dozen" mainframes, all V/5 and V/6 models. A V/7 line has been started and its first product will be delivered soon.

Cautious optimism expressed by Wall St

US stock markets began the new year in a mood of cautious optimism. Prices have risen despite the flow of disturbing news from abroad, providing welcome relief to those who had seen their portfolios shrink during the final quarter of 1978.

One event that has helped improve Wall Street's outlook is the planned split of IBM shares. The division of shares by four will bring the price, now somewhat above the 300 level, down to a range that many investors can afford. Even with the gains in prices expected by most analysts, its shares should be selling for 80 to 85 when the split becomes official in May.

Harry Edelson, computer stock analyst with Drexel Burnham Lambert, points out that the odds favour an improvement in IBM prices for the next several months. He said IBM's shares with one exception have risen for about six months following an announced stock split. The exception is the split that came at the time of the 1974-75 recession.

The computer industry expects another record year of prosperity, despite the problems that could beset less dynamic industries. The only weak area in DP appear to be leasing, which is always in trouble when new IBM systems are first announced, and the personal computer field, which is booming but served by many more [illegible] companies than it will support.

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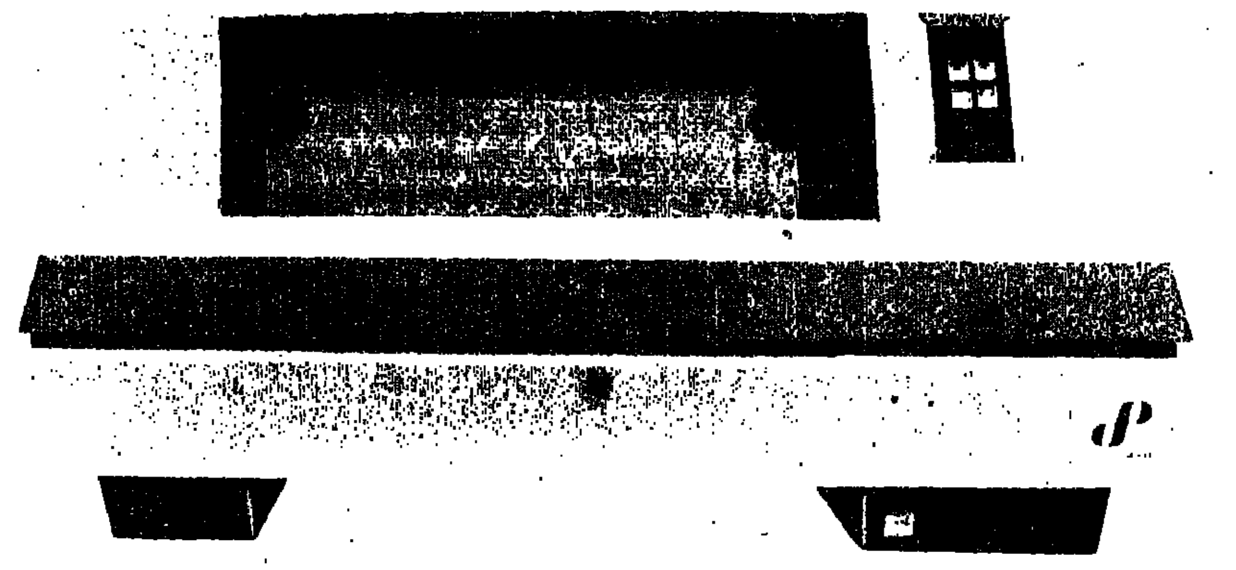

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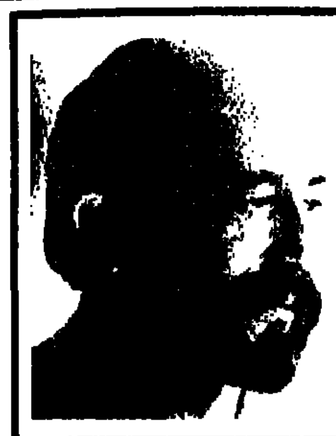
IBM's Starfleet changes tack



One of the leading experts on the computing and information industries, Charles Lecht, writes his first article for Computer Weekly.

Founder of Advanced Computer Techniques Corp, Lecht has been working in the computing industry since 1951 and has been running ACT since 1962. The company started as a "one man band" and now employs over 400 people in its computer services and software operations which include bureaux in New York, Phoenix, Arizona and Edmonton, Canada, and consulting operations in New York, Milan and Washington.

In 1976 Lecht was voted one of the top 10 businessmen in America for companies with revenue of under $1 billion and his book, The Waves of Change, provided an original insight into the nature of technological innovation.

In this first article, Lecht provides an overview on one of the most significant manoeuvres in the computer business in recent years, the re-orientation of the Great IBM "Starship."

IT is a fair working hypothesis that IBM's "star fleet," with its six divisions including data processing, general systems and office products, initiated a significant change of course in early 1975.

In January 1975, F. T. Cary's announcement on the redirection of its proposed Future Series resulted in a shift in the major development thrust of the company and its businesses.

It should come as no surprise that the enterprise responsible for turning out most of the world's computer systems was also expert at using these very same instruments internally to forecast its own direction and new markets of opportunity.

Synthesising increasingly complex world economical, political and technological data, and anticipating new threats and challenges to its mission, IBM's high command demonstrated that it was acutely sensitive to the value of marketplace and competitive intelligence as major factors in charting its future course.

Today, IBM's direction prefigures that which will ultimately be taken by the entire information systems industry. To this point, I foresee all companies [illegible]

Mainstream: those companies which configure and manufacture information systems, from data origination through to dissemination, including manual as well as automated environments. These companies will purvey these systems and/or sell their data processing power.

Component: those companies which manufacture parts of an information systems environment, usually hardware and/or software.

Device: those which make processor logic-based items, some of which may be parts of a component (or components themselves) for an information system, although not necessarily. Included are all devices which have some form of artificial intelligence, usually through incorporation of microprocessor logic.

Consulting: those which market the services of one or more persons individually and/or severally (the work could involve high-level systems engineering and include all aspects of information systems endeavour at one time or another).

Fringe: those which provide specialised products such as supplies, facilities, etc.

While this classification system may not in itself seem too revolutionary when compared with today's, its corporate constituences will be radically altered.

Although I see but a few companies in the Mainstream businesses in our future, there will be great numbers in the Component, Device, Consulting and Fringe areas; many more than now exist. Some may host "product/service lines" which involve items taken from several of these areas (eg, make a component, provide skilled people, etc).

IBM's main thrust will be to capture as much of the world Mainstream business as possible while controlling as many of the others as practical through direct and indirect influence. It will do all of this through a restructuring of itself as a more flexible and adaptive cluster of companies and through initiation of joint-venture-like arrangements (including part ownership) with many other companies. The starfleet is *indeed* changing while turning.

Some companies seem oblivious to the fact that IBM altered its course at all; their product plans betray their management's maladaptive instinct for following the leader whatever it does.

Once having achieved ruling status in the early 1970s, IBM excited a measure of concern within the US Justice Department by virtue of the size of its arsenal of competitive weaponry (products, services, plants, cash, etc) and its practices.

Swift changes in "traditional" business boundaries such as those that have led to the collision of the communications and computer systems technology sectors, brought IBM into conflict with yet another previously benign superstar: telecomms giant AT&T.

Equally fast-changing product profiles within the evolving information systems business have also resulted in friction between the great giant and the other micro/mini/maxi manufacturers and service companies.

At the same time, in the growing din of protest over unfair practices lodged against IBM were born new business opportunities based on the emerging ease with which companies other than IBM could introduce IBM/compatible or replacement products.

Despite all this turbulence, IBM's high command seems to have remained very cool, although examples can be cited where overreaction, bad timing, etc occurred.

1979 will be the year when today's information systems companies, unprepared to produce full information systems, will falter, either radically changing their businesses to Component, Device, Consulting, Fringe, or getting out of the industry.

Those that succeed will have accepted the fact that the process of information systems creation involves mastering a metaphor for the instrumentation of man and his environment.

One could argue, I suppose, that the waves of technological change which have swept over the entire information systems community could by themselves have accounted for IBM's change of course.

IBM's need to maintain corporate momentum (consider their revenue objectives, calling for increases of $2 billion in 1978, $3 billion in 1979, and $4.5 to $5 billion in 1980) might be viewed as the primary stimulus for its change of course.

What is so spectacular about this change of course is that thus far it has not seriously compromised yearly corporate objectives. In view of miscalculations like Future Series and the timing of 370 systems introduction this was no mean feat.

As IBM changed course, its management kept a startling silence on their long term objectives. Since 1975, it has deployed so many products as to obscure, at times, which are scheduled for long-term development and which are one-time phenomena. One thing that is clear from this is that great financial resources indeed would be needed by any would-be across-the-board competitor.

A company intending to attack an IBM one-time phenomenon marketplace may do so with reasonable chances of success. However, its business will be extremely susceptible to changes in IBM strategy for upgrading and/or migrating its customer base.

Starting with the small 5100 line, we have seen at least 12 major announcements in the past three years including the 8100, Series 1; System 32, 34, 38; the 3031, 3031AP, 3032, 3033 and SNA. It's my opinion that at a minimum, Series 1 (if not System 32, 34 and the 5100) is ephemeral although we may expect some limited upgrading to happen.

As formidable as IBM's corporate fleet may have appeared in 1975, its management's major decision to alter course was still heroic. The armada entered uncharted space (distributed networks, office automation, unbundled and separately priced selectable software units, etc) carrying along in its wake much of the world's computer industry.

Since it is by no means a rudderless ship, the IBM "Starfleet" headquarters has been carefully changing its business emphases from the *manufacture* of computer systems and office equipment to the integration of communications, word processing, process control, etc and the rendering of increased personnel services.

Although it is too soon to describe exactly the nature of its late 1980s businesses as IBM's management may envisage them, I see the emergence of IBM as a superscale "information systems and communications utility" enterprise, ultimately depending only on itself for technology (although it may choose to buy some of it as it does today from TI, Intel and others), and purveying its wares, hard and soft, through a galaxy of products and services.

Economic nationalism and the maturation of other US as well as foreign companies, notably Japanese, are a factor.

Some would say that corporate strife is serving to inhibit the corporation's progress, but I don't place too much trust in this judgement.

IBM's Starfleet may indeed be on target. Whether it will make it is not, of course, a foregone conclusion; uncharted voyages *are* dangerous. If it does — and there is good reason to believe that it will — today's debates on the nature of the world information processing industry at the end of this century will be settled.

By Charles Lecht

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ICL finances catch up on CII-Honeywell Bull

FULL year figures for the 53% French-owned CII-Honeywell Bull show the company just ahead of Britain's ICL with a turnover of 4,500 million francs, equivalent to £528 million for the year to the end of December 1978. ICL's turnover, struck three months earlier at the end of September, was £509 million (CW, December 21, 1978). However, ICL is catching up, since last year's CII-HB turnover of £446 million was well ahead of ICL's £419 million. ICL grew 22% in the year, while CII-HB grew 17.6%.

The improvement recorded by CII-HB is substantial, with net profit up 26.8% at 190.4 million francs, £22.4 million. Pre-tax profit of 230.9 million francs, £27 million, was well ahead of the subsidy received by the company from the French government during the year of 212 million francs, £25 million.

CII-HB gets its last tranche of government money, 100 million francs, £11.8 million, next month, after which it must plough its own furrow.

Research and development investment last year was 500 million francs, almost £60 million. ICL does not reveal its R&D expenditure, but it is thought to be not more than £50 million. CII-HB did 48.4% of its business outside France; ICL did 51% of its business outside the UK.

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INTERNATIONAL NEWS IN BRIEF

Guarantee for Tandberg lines

THE data systems side of the Norwegian electronics company Tandberg, declared bankrupt last month (CWI, January 11) will continue production this month under a guarantee from Siemens, a major customer for Tandberg peripherals. The plan is for the division to be spun off into a separate company in which Siemens would like to take a 40% stake, and negotiations on this with the receiver and the Norwegian government are continuing.

French coup

FRENCH communications specialist Jeumont-Schneider has scored a significant coup in the US, signing an agreement under which its large digital private telephone exchange systems will be marketed by Tele-Resources Inc. The American company plans to manufacture the 3,000 line exchanges under licence in due course.

Japanese venture

IN a joint venture between Memorex and Teijin, a Japanese textile firm, Teijin is to manufacture Memorex floppy disc media in Japan. Teijin already supplies Memorex in the US with polyester film. The new manufacturing operation will be 51% owned by Teijin, 20% by Memorex Corp and 29% by Memorex Japan.

Amdahl order

SYDNEY brewery Tooth and Co is reported to have ordered an Amdahl 470V/5 mainframe from Fujitsu subsidiary Facom Australia.

Second delegation from EEC leaves for India next month

FOLLOWING the success of last year's delegation to India of EEC software companies, another EEC computer delegation will leave for the sub-continent on March 17. In part as a result of comments and recommendations made by the last delegation, the Indian government has significantly relaxed its policies for the import of computer equipment and expertise, and is particularly interested in talking to European hardware companies on possible joint ventures in India on both hardware and software. Among the European companies sending representatives this time are minimakers Dietz of Germany and Computer Technology of the UK.

The Indian government is looking for dramatic growth in its small but flourishing computer industry, and recognises that to develop competitive software it needs the latest hardware. It has therefore relaxed hardware import restrictions.

It is also interested in manufacturing terminals and small computers, and is prepared to accept a much higher level of imported components than hitherto.

It is also keen to collaborate with European software companies on socio-economic projects which could be of benefit in India and also have export potential to other Third World countries.

Areas of interest include applications like rural health administration, town planning, adult education, law enforcement systems, agriculture and education.

Companies interested in sending a representative should contact Miss Claire Francois at the EEC Commission, telephone Brussels 735 8040 extn 5015.

COM bureau purchase

EUROCOM DATA, the international computer output microfilm services company, has bought a COM bureau in Helsinki from Systek Oy, a major computer services and software house. Eurocom is a subsidiary of the National Westminster Bank and already owns COM bureaux in Sweden, Denmark, West Germany and the UK.

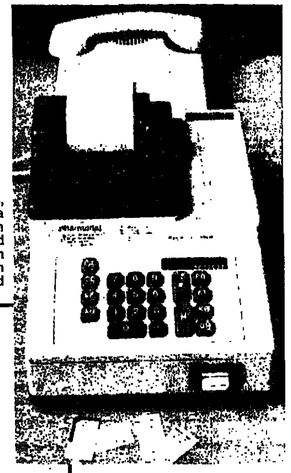
Univac scores in Tokyo

THE Univac 1100 line continues to score in Japan and the latest order comes from the Taiyo Kobe Bank in Tokyo, which is spending $10 million on a large-scale 1100/82 mainframe, due for installation this month. Univac is keen to expand its business in the banking and financial sectors and, as exclusively revealed in Computer Weekly (November 23, 1978) is hammering out an agreement with Bunker-Ramo under which Univac will recommend the latter's banking terminals to its financial customers.

Just what the doctor ordered

A HIGHLY automated telephone ordering system for 60 chemists in the region around Hamlyn in Brunswick, West Germany has been set up by pharmaceutical wholesaler Heimberger. Based on a Modcomp II minicomputer, the key element of the system is the specially designed Pharmadat terminal shown here. Prompted by the computer via a VDU, telephone order clerks regularly call each of the shops to get their orders for drugs and other supplies.

But instead of reading out his order over the telephone, the chemist feeds a cassette of small plastic punched cards into a card reader on the terminal, and the Modcomp II makes up the order automatically on the basis of the number of items sold since the previous order.



Facit buys 50% of Dataroyal

SWEDISH computer peripherals and office equipment manufacturer Facit has bought 50% of matrix printer manufacturer Dataroyal of Nashua, New Hampshire, for $1 million.

Specialising in three-in-one printers capable of printing standard text, variable size characters and bar codes, Dataroyal was established by Royal Business Forms with key staff from Contronics.

Royal retains 30% of the shares, the remainder being held by employees of Dataroyal.

Dataroyal employs 75 people.

AT&T plea could put up US phone charges

THE US Federal Communications Commission has indicated that it would grant an AT&T request to speed up the rate at which its capital equipment is amortised. The effect on the telephone system user in the US which traditionally has had one of the cheapest phone services in the world, would be sharply higher charges.

Faster amortisation is essential to AT&T if it is to compete with thrusting newcomers to the telecommunications business like IBM and Xerox.

The problem is that telephone equipment is typically designed for a long life span — anything up to 40 years. The net effect is that while IBM and Xerox have already depreciated about half their investment in plant and equipment in the field, AT&T has only depreciated about 7% of its enormous investment in telephone switching and other hardware, currently valued at $160,000 million.

Iraq contract for CII-HB

ALREADY well established in Iraq, CII-Honeywell Bull has picked up a significant new contract for a Level 66/DPS mainframe from the university centre at Mosul, the city better known as the ancient Nineveh.

It is the second largest university in Iraq, and each college will have its own terminals attached to the mainframe which will also handle work subcontracted from government bodies in northern Iraq.

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Japanese firm's packet net

A PACKET switched network is being used to link different make computers in the Kyoto and Tokyo offices of Wacoal, a Japanese ladies' underwear manufacturer.

The network was developed jointly by Wacoal and Digital Computer Co, a Tokyo-based systems house, and is claimed to be the first packet switched network to be installed in a commercial company in Japan.

The network, which is capable of duplex transmission at 9,600 bps, links several Hitachi Hitac computers in Tokyo to a Burroughs B6800 in Kyoto and allows telex, facsimile and voice transmission as well. The two node switches are based on Hitac minicomputers.

It replaces a network in which each Hitac computer was linked by a separate leased line to a B4700.

A spokesman said Wacoal had chosen to develop its own network architecture so as to be manufacturer independent.

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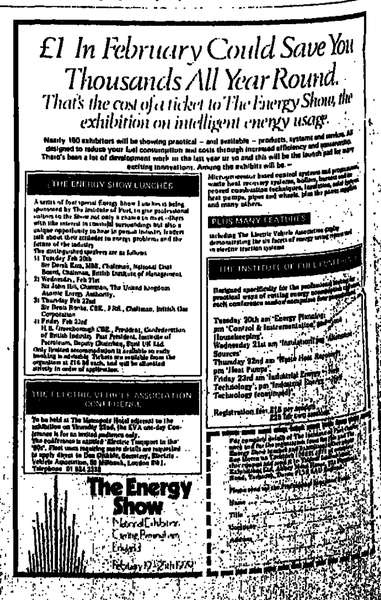

COGARVIEW

Voice is coming... but mainly for input

A PREDICTION for the 1980s: one of the dominant media of data entry in wholly new systems will be the human voice within the next 10 years. Nonsense? I think not.

Although no significant strides seem to have been made in the technology since the much-vaunted but little achieved introduction of the first commercial systems five years ago, I suspect that a major breakthrough is around the corner.

As late as 1974, a year after Threshold Technology told the world about how efficiently General Motors was using its admittedly very limited VIP-100 isolated word system, a session on voice input at a British computer convention had to be cancelled for lack of interest. Largely similar occurrences sprouted elsewhere. Talk about ostriches!

It seems to me axiomatic that the computing tide is running strongly in favour of voice input. Five years ago processors were expensive, and so correspondingly was processing time. Storage was at a premium, too; database space was not to be wasted on complex syntactical recognition sequences when card readers were around.

Today the relative costs within a computer system have swung hard around. It's not processing that's expensive today, but data capture. With the new emphasis on putting the computer power where it is needed — on the end-user's desk — the cost of terminals and telecoms has become a behemoth.

Distributed processing implies a return from the laboratory to the office. Computing is becoming less and less the preserve of a highly trained and highly paid few, much more the everyday tool of ordinary men. The last hurdle to be overcome is the interface between man and machine. Great strides have been made with high-level languages and terminal design, but the logical end of all the work put into the demystification of input/output is surely direct voice communication with the computer.

Furthermore, the advent of computer networks has shown us the way to conquer the problem of tying up the database with the vast amount of syntactical and speech-pattern data needed to service a reasonably clear-speech voice entry system; share it.

A common voice input database shared between many subscribers to a single network is almost a classic demonstration of the power of the network as an operational tool.

The argument in favour of voice input, however, cannot rest only on the idealistic goal of natural interaction between man and machine. In the ivory towers of the universities, that may have an academic appeal which becomes its own justification. But in the hard world outside there has to be a bottom line involved.

Great strides have been made with high-level languages and terminal design, but the logical end of all the work put into the demystification of input/output is surely direct voice communication with the computer.

And there is. Witness Continental Can of Chicago, who decided three years ago to introduce voice input for quality control of ring-pull can lids.

Continental Can inspectors used to have to read-off measurements from stress gauges and a variety of other instruments, marking the readings by hand on to data recording forms which were later entered in bulk by data preparation staff: a classical 1960s/1970s sequence. The company toyed with the idea of re-equipping the test beds rather expensively but quite effectively with recording gear that would enter digital read-offs directly into the computer. But they were persuaded by Threshold Technology to have a go with voice input instead.

What happens now is that the inspectors read off the old gauges aloud, so that data entry occurs simultaneously with the conclusion of one test and the start of another, and the inspectors retain the freedom of both hands to perform the intricate testing function. Time-saving is 50% per test, and staff numbers have been reduced by 20%, with no drop in quality control.

Furthermore the inspectors can use the gauges and meters in any order, leaving it to the system to sort out the format. Thus any piece of equipment can be put to use by a second inspector the moment it is freed by the first, even if that takes place outside the usual sequence of tests. Previously, to prevent confusion during data preparation, the tests had to be performed to a pre-determined sequence which could not be varied to take account of equipment availability.

The Threshold 500 systems in use at Continental Can cost $10,500 each with 4K of random access memory, so it is not a particularly cheap option, especially when you count in the 24K Nova mini which acts as intermediary between the voice recorders and the central 370 mainframe. But Continental Can is happy with the savings made, and so, on the figures they quote, would any company be.

Take Dialog Systems' voice recognition kit which, based on a PDP-11/04 mini with disc and high-speed vector processor, can simultaneously decode eight voice input channels, functioning much like a Touch-Tone decoder. Its first large-scale user, the Illinois Department of Administrative Services, anticipates making $222,000 savings already in the first year through entrusting the routeing and billing of credit card calls to the system, which can be accessed via 20 In-Wats lines and a fixed disc-based 32K Nova 1200-aided "Wats Box" telecommunications controller, and also employs voice response to verify credit card and destinations numbers.

Communications giants AT&T and IBM are both wading into voice storage networks with their respective VRS and SFS systems in the US, and their early announcements already suggest that the real pay-off of voice is likely to come in a security-minded environment where the system can be used for recognition as well as input.

Further advantages for networks, where voice pattern recognition can take the place of codes for access protection — one less bit of technological mystification for the user to worry about — also become clearly discernible.

The cost advantages of voice input seem bound to increase as the years go by.

Voice data entry equipment manufacturers pocketed some $2.5 million from 1977 sales in the US, according to industry estimates — a relatively paltry sum which should quadruple by 1979, in step with the enhancement of the "vocabulary" of data entry terminals. Proof that such a trend is already under way is provided by a whole spate of new products on the market. Interstate Electronics Corp's unit, which boasts a 900-word vocabulary and sells for $11,000-$18,000, is one notable example.

I am much less confident about the future of voice output, recent advances in audio response notwithstanding. It looks like an expensive gimmick. Reading output off a display comes a lot more naturally to users than entering data on a keyboard.

Whereas I am convinced that voice input breaks down barriers between man and machine, I strongly suspect that synthesised voice output actually interposes its own inhibitions through the psychological rejection of the synthetic "voice" as an adequate representation of human speech

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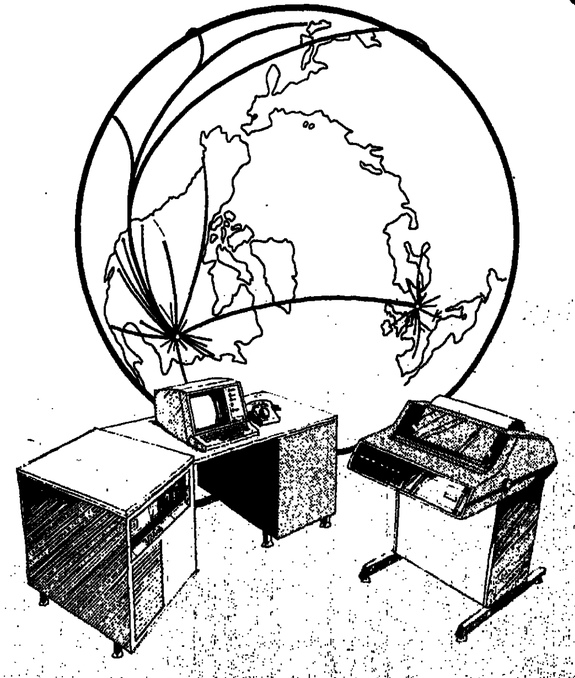

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REPORTS FROM THE FOUNDATION–2

Reports from the Foundation is a Computer Weekly series based on the work of the Butler Cox Foundation research group. The reports examine a variety of topics relating to the development and use of information technology. The author of this feature, JOHN KINNEAR (pictured left), is a partner with Butler Cox and Partners. He is responsible for much of the Butler Cox Foundation research concerned with office automation, and in particular is author of the Foundation Report, Trends in Office Automation Technologies.

The Butler Cox Foundation is a research group which examines major developments in its field — computers, telecommunications, and office automation — on behalf of subscribing members. It provides a set of "eyes and ears" on the world for the systems departments of some of Europe's largest concerns.

The Foundation transmits its findings to members in three main ways:

- **As regular written reports**
- **Through management conferences and,**
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Key requirement for office automation

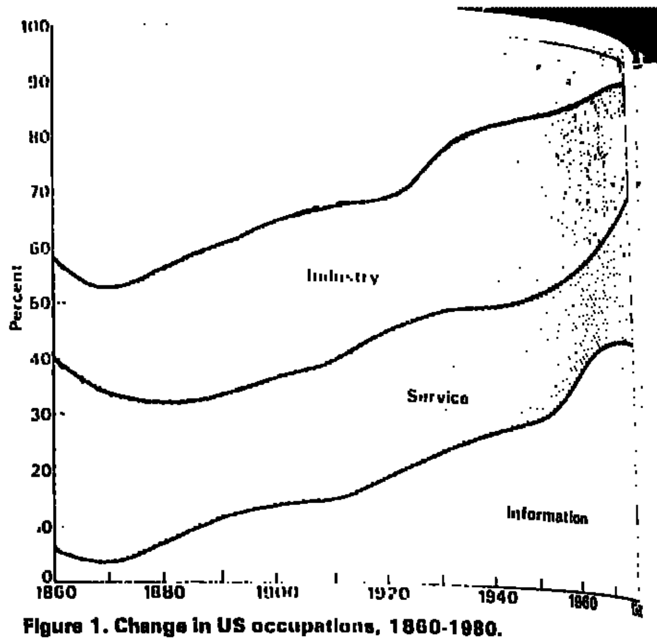

Figure 1. Change in US occupations, 1860-1980.

TODAY the aims of most office automation products are to control or reduce the costs of office support activities. However, the largest and fastest growing sector of office labour cost is that of professional and managerial workers.

In our view the key requirement for office automation is for equipment and services to support this group of workers. This involves not only a change in the design emphasis of equipment and services, but also the need for users to take a much wider view when evaluating new systems.

Figure 1 shows how the number of people employed as information workers has been steadily increasing during the last 120 years. These are people whose occupations are wholly concerned with the acquisition, manipulation, storage and retrieval of information.

At the turn of the century about 10% of the working population were employed in this way; today it is about 50%. A large proportion of these people either work full time in offices or are based in offices. At the same time there has been remarkably little investment in equipment to support their work.

Figures published in 1974 showed that a manufacturing worker in the US was supported by capital equipment worth $25,000 whereas an administrative worker used only $2,000 worth of equipment on average. Today the investment is higher but the ratios remain the same.

In line with this, investment manufacturing productivity has increased some 50-fold since the turn of the century, whereas the productivity of the administrative worker has perhaps only doubled.

This history of low investment, coupled with the dramatic fall in the cost of computing equipment in recent years, is seen by many suppliers as a major opportunity. For example, if the administrative worker were given only half the capital investment that the manufacturing worker enjoys, the resulting market for equipment in the UK alone would be at least £50 billion.

There is clearly a need to analyse the office workplace and the needs of the office worker to identify what equipment and services would produce most benefit. A research study for the Butler Cox Foundation in 1977 identified managerial and professional staff as a key target for office automation.

While the number of secretaries, typists and clerical workers employed in UK offices has remained virtually static over the last decade, the numbers of managerial, professional and technical workers have increased by over 50%.

When the 1976 figures are translated into employment costs, it becomes clear that managerial and professional workers are not only the fastest growing group, but also the most expensive, accounting for over 60% of costs.

By contrast, only about 10% of office labour costs can be attributed to secretarial and typing functions. Studies by SRI, formerly the Stanford Research Institute in California, show that typically a secretary spends only a quarter of her time at the typewriter, which would imply that typing costs only account for some 2½% of office labour costs. We should bear this in mind when considering the justification for word processing equipment.

Clearly global figures of this sort cannot be applied to individual situations. There will be many offices where typing is a major cost element, and where much processing can be justified by improvements in typing productivity alone.

The real benefit from word processing may be in a saving of the time of managerial and professional workers, due to reduced proof-reading and faster turn around of work. But there is a real danger that organisational changes caused by the introduction of word processing may reduce the productivity of the expensive professional and managerial staff.

For example, if the introduction of word processing means the loss of individual secretaries for the sake of improved typing efficiency, a worse service may result.

Our view is that if one is trying to improve performance of professional staff it is more important that everybody's secretary should have a word processor rather than the word processors be geared to maximising typing productivity. This may mean changes in equipment design and marketing.

For example, some features such as the ability to move paragraphs from one section of text to another, may make the equipment significantly more expensive, resulting in a less widespread use. Moreover such features also increase the complexity of operation of the equipment, making it more difficult for a temporary secretary to take over, or for the manager himself to use it if he wishes. But the main change needs to be in the marketing emphasis of the suppliers and the user's attitude towards justification.

Today most manufacturers stress the potential improvements in typing productivity, and most users justify the equipment on this basis without taking into account the full costs and benefits to the organisation.

The same thinking can be applied to other types of office automation technology. Stored program telephone exchanges are often sold and justified on their ability to control telephone costs and to optimise the use of private networks, rather than reducing telephone connection times and improving telephone service to managerial and professional workers.

There is considerable scope for development in enhanced voice communication aids. A recent survey in the US showed that only 27% of business telephone calls were successful.

What is needed in the future is a change in emphasis from the reduction of office support services to the optimum utilisation of the most expensive office resources — managerial and professional workers. More research is required on the needs of these groups, but some needs are beginning to emerge.

Clearly there will be areas where the introduction of new equipment and systems will cut costs and these can be worthwhile short-term applications.

However, the office is a complex environment with many inter-related tasks, and management services work should ensure that they take into account all effects and the costs of systems rather than isolate just one function.

Chips and the showmen...

THE title, I suppose, is inevitable. We've had "The Chips are Down"; doubtless we will soon see plays and TV programmes called "Chip of Fools", "Sink me the Chip, Master Gunner", and (an optimistic piece) "I See No Chips". So we can't really blame the Covent Garden Community Theatre for calling their hour-long musical play "When my Chip Comes In".

Martha Gibson, Dave Brett, Andy Cunningham, and Tom Goddard harmonised with a washboard-playing computer in "When My Chip Comes In."

The show opened last week at City University Students Union and is carrying on an itinerant existence at pubs and little theatres, wherever hospitality is offered. The Covent Garden group specialises in this. One of its best-known past pieces was "Corgi and Bess" — for the Jubilee, of course.

Titles aside, the show is delightful, and goes a long way towards making up for the dearth of effective entertainment about computers. The story concerns the takeover of a fish-gutting factory by microprocessors, or rather by a scheming youth called Sly Droid and a misguided scientist, Mr Boffin, using these cunning devices.

For the benefit of the uninitiated the complete history of technology is explained in five minutes flat — very neat. I hope the DoI will copy this for its micro appreciation courses.

The first of several engaging songs comes in here, with the refrain "The boffin saw what God had made, and said, 'God's got it wrong.'"

After the microprocessor revolution there is another song which the computer accompanies on the washboard, and then the unfortunate newly-unemployed fish gutters are sent to the Retraining for Leisure Centre. There, Bozo the Clown Computer attempts to entertain them, with little success, and the workers plot to return to the factory and stage a counter-revolution.

This the villains plan to fend off by electronic eavesdropping and prying into personal files, leading to the play's first batch of moralising about computer privacy, confused and factually incorrect but finishing with a great duet.

More and more Message then starts to come out, along the lines of "We must control how computers are introduced," presumably meaning that Tony Benn and Industrial Democracy are the answer to all our problems. Shudder.

The boffin eventually sees the error of his ways, coming out with some amazingly twisted platitudes such as "From now on I'll be using my head instead of my head using me."

Muddled politics aside, the show is very funny and performed with great gusto and not a little skill by Dave Brett, Tom Goddard, Martha Gibson, and Andy Cunningham, who act, sing, and accompany themselves on a variety of instruments.

The question is, whether all the confusion and misconceptions about computers in the minds of the public will be made better or worse by this opus. Probably worse. Oh, what the hell, it's fun.

The play will be touring pubs in Covent Garden in March, and is available for other bookings. Information from 01-836 0617.

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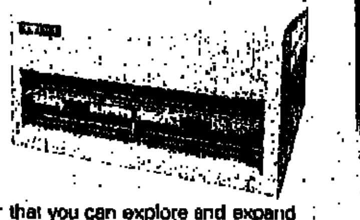

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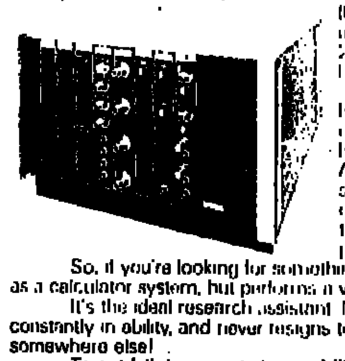

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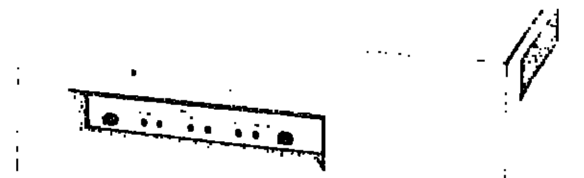

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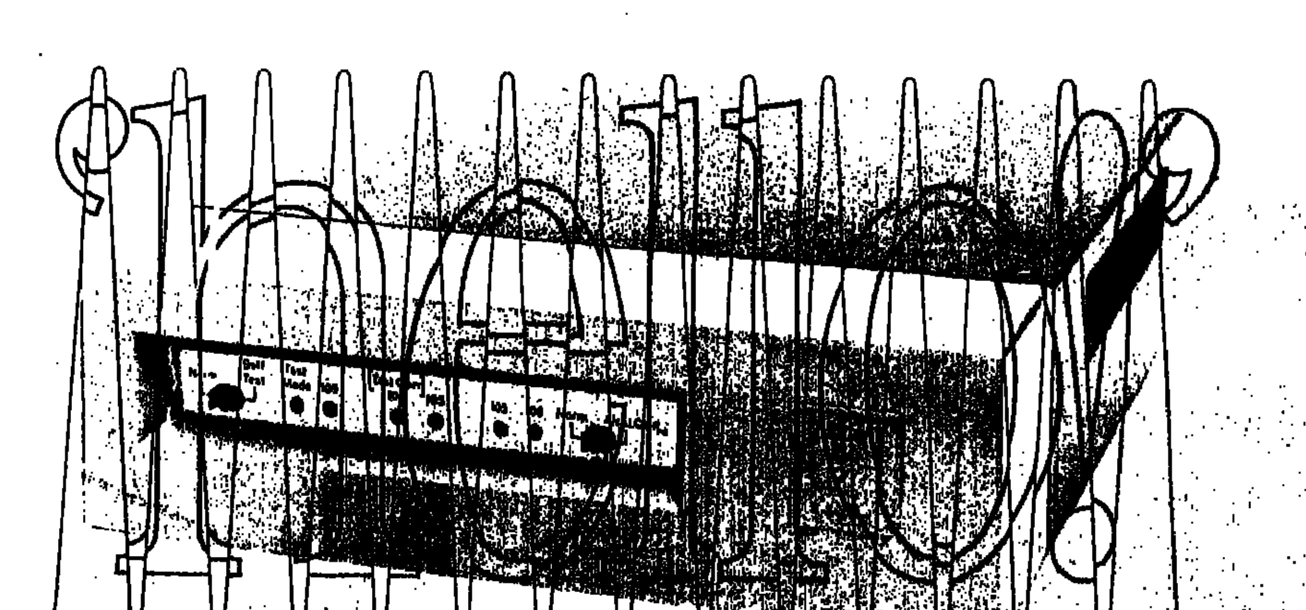

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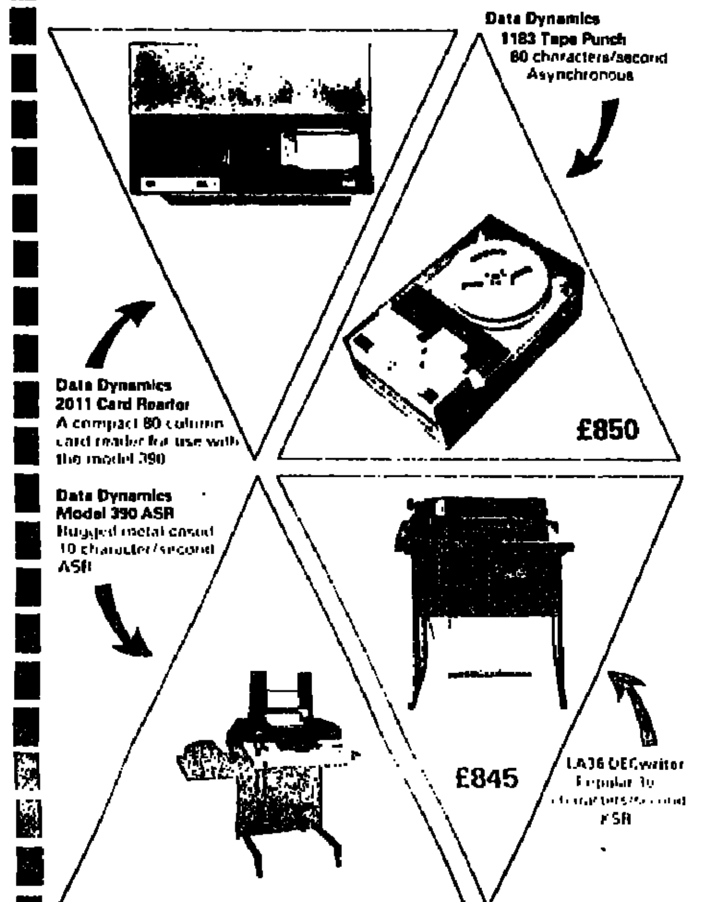

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Applying yardsticks to your system's real performance

By Nick Pollard

Performance measurement by either hardware or software has become a bone of contention in recent years. NICK POLLARD, manager of CPP UK, points out the advantages, and occasional disadvantages, of having a yardstick applied to one's achievements.

THE advantages of performance measurement by either hardware or software have, over the past couple of years, been points of contention. They would of course have been points of contention before that, except that it is only in the last couple of years that enough people have come alive to the idea of performance to make them contentious issues.

The arguments, briefly summarised, go like this. If you've got a hardware monitor you can fit it on to any machine you may be capricious enough to have installed — they are hardware independent, as the catchphrase goes. So if you have an ICL 2970 and an IBM Series 1, you're all right.

Also, a hardware monitor does not affect what it is monitoring, whereas the very fact that the software monitor is being used alters the normal running of the machine. For strict accuracy, you need a hardware monitor.

But by its very nature, a hardware monitor will give you only a restricted picture of what's going on in your installation. It can tell you, for example, which discs are being used, but it cannot tell you what is on those discs. It can tell you how busy a device is, but it cannot tell you whether having that device busy is a good or bad thing so far as any particular program is concerned.

In short, a hardware monitor just won't get at specific software functions. Take a software queueing mechanism, where the queue consists of requests to look at a database. A hardware monitor will tell you that the input/output to the disc is 70% busy. A software monitor will inform you whether a 70% busy input/output device represents a blockage to the system as a whole, whether having a high number of requests waiting is a major problem.

In addition, say the software monitor proponents, the hardware monitor's connectability can be a liability. Because with each different machine you have to discover where to put your probes — a task made more tricky by the fact that these connection points are frequently missing from systems documentation.

You have got to open up the back of the central processor and delve around; this task, if entrusted to ordinary hands, can result in rather expensive malfunctions afterwards. Properly, it should be entrusted to electrical engineers' hands, and these are often neither easy nor cheap to come by. Even then, it is not unknown for probes to be connected the wrong way round, thus resulting in, to say the least, measurement data that is slightly off.

But, reply the hardware advocates, it's all very well to sneer at the jack-of-all-trades approach — the software monitor is master of one. If you're not running on IBM, you're pretty well stuck, because while IBM and independent suppliers have written monitors for MVS as well as the other IBM operating systems, there is hardly anything available for other manufacturers' equipment. Although in this respect it is fair to mention that ICL is looking to bring out a monitor for its 2900 series.

Of the two, hardware monitoring is probably generally more expensive, although you could start with either for about £5,000. It would not be an unfair general conclusion, though, to say that most of the data required for efficient monitoring can be produced through a software monitor sitting on five to ten cylinders of a disc.

Best known hardware monitor suppliers are Tesdata, Dynaprobe and Comress. Hardware monitors are really used most effectively on big sites, as well as for intricate jobs like special usages or special applications.

As mentioned earlier, performance measurement has only become an important area of computing over the past two years, although it has certainly been available for longer than that. What is the reason for the growth of interest?

There are various reasons, but the main one is that there has been gradually increasing pressure from outside computer departments to ensure that the costly resources are used efficiently — as efficiently as simpler resources throughout the rest of a company, such as typewriters, desks, the machines and people, are used.

It's all part of the process of demystification of the computer installation: the directors may not know exactly how it works, but they can compare its output with that of similar installations. If the result is not favourable, the measurement tools available will help even the non-computer man understand what is going wrong.

This is an important point: the print-out produced by measurement tools is looking less and less like the result of an involved calculation involving a book of log tables and the expected population of China on January 23rd, 2035. Increasingly, pictorial representations of results are being used to make analysis easier — bar charts, graphs and histograms, for example.

Having your inefficiencies exposed to the rest of the organisation can be embarrassing, but it is an integral part of the painful process of demystification.

More and more, computer managers are being considered in exactly the same way as other departmental managers, and this means that they have to answer basic management questions as to resources and usage.

But it has its positive side too. Hardware upgrades become not only justifiable — they can be seen to be justified by outsiders. You will be able to say: "I need two new tape decks and another disc drive. Look." You'll probably find it easier to live with than: "What do you mean, why did I need those two new tape decks and a disc drive? I needed them because . . . because . . . because . . ."

First Series 50

THE first Series 50 32-bit Prime computer to be sold in the UK is going to Sherwood Computer Bureau of Romford, Essex, the firm that runs a bureau service on ICL 1900 mainframes for insurance syndicates at Lloyds and associated firms of accountants. Sherwood will install the machine, with a London firm of accountants.

4300 service

THE big IBM data centre in Warwick is to provide comprehensive remote program development services under the VM/370 operating system. While they are awaiting delivery of their machines, customers for IBM's new 4300 series will be able to develop programs from terminals installed at their own premises.

Now comes chessboard that speaks each move

ADDING to its Chess Challenger range, Spectrum Marketing has introduced two new models — a seven level basic Chess challenger, and one that speaks each move, claimed to be the world's first speaking computer chessboard.

Called the Voice Chess Challenger, the latter model features about 10K of RAM and 12K of ROM, and the makers say that it will have "the strongest chess program to be placed in a microprocessor" and be "twice as fast" as its other models.

As it has speech synthesis, operation of the device is possible by blind people.

The Chess Challenger 10 (CW, October 5, 1978) is currently the most powerful in the range, using a Zilog Z80A micro.

Expected price for the Voice Chess Challenger, which will be available in July, is about £2...

The seven-level-of-play Chess Challenger Seven will be available in April at a cost of about £100.

Also announced by the company is an "astrology computer" called Zodiac which will generate individual horoscope charts.

Planet positions at time of birth and corresponding personality characteristics are provided as are suggested plans of action for any day "past, present or future".

Particular courses of action with regard to the present astrological conditions for individuals are given too.

Available in June, Zodiac will cost £25.95.

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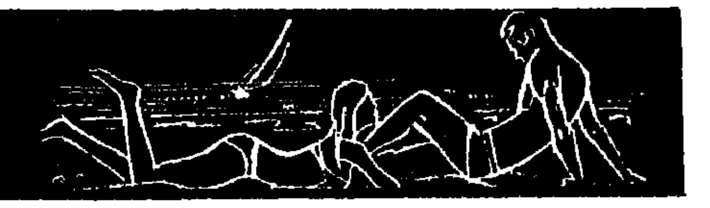
OPPORTUNITIES IN WALES & THE WEST COUNTRY



MINI TURNKEY SYSTEMS – BRISTOL

To keep pace with their tremendous growth potential our clients, Wilks Computing, a Software house, rapidly becoming a major force in the marketing and development of commercial Turnkey Systems specifically for DEC PDP Hardware, require the following:

SENIOR SYSTEMS ANALYST

Working individually or in control of a small project team, the Analyst will predominantly be involved in the design of financial or commercial 'on-line' systems, although current development plans include the development of manufacturing related applications.

System design on a commercial Mini would be an obvious advantage, however, it is fully appreciated that the qualities required for this position will obviously apply to applicants from a mainframe environment.

Although as a Senior Analyst, it is unlikely you will be required to programme, as the emphasis will be on System Design and project control. It is vitally essential that potential applicants have at some time programmed, if they are to fully appreciate the capabilities of the Hardware in use.

ANALYST/PROG

Working at an intermediate level, being involved in both Systems and applications programming, it would again be an obvious advantage if applicants had previously worked on a commercial Mini.

However, Wilks are willing to retrain their Analyst Programmers or Commercial Programmers with Systems knowledge particularly if they have worked in a small mainframe environment using Cobol or a related language.

As a further alternative these positions may be of interest to a young Analyst wanting to move from Mainframe to a Mini computing environment.

PROGRAMMING SUPPORT

Within this group there are a wide range of opportunities; Wilks are particularly ingerested in recruiting at various levels, experienced DEC PDP basic + or Dibol Programmers.

Also of interest would be young commercial Programmers, interested in Programming on DEC/PDP, or alternatively numeric/scientific/Computer Graduates wishing to become Trainee Programmers.

Applications for these positions will be only considered through Sanderson Executive. For further information phone or write to Keith Dawe, Sanderson Executive Recruitment, 9A Princess Victoria Street, Clifton, Bristol 8.

Sanderson
EXECUTIVE RECRUITMENT
TELEPHONE 0272 39302

UNIVERSITY OF EXETER
LECTURER IN COMPUTING SCIENCE

Applications are invited for a lectureship in the Department of Computer Science tenable from 1 October 1979.
Candidates should be qualified persons working in any area of computer science. Specializations which are of particular interest, but which are not intended to make up an exhaustive list, are data-base computation and theory, artificial intelligence, computer architecture and systems, theory of programming languages and semantics, operating systems; distributed computing and networks.
Commencing salary will be within the range £3883-£4631 p.a. (under review) on the sale £3883-£7754 p.a. (under review). The post is subject to a probationary period not exceeding three years with the prospects of permanency thereafter.
Further particulars may be obtained from Miss Doreen Watson, University of Exeter, Northcote House, Exeter EX4 4QJ, to whom applications (eight copies, overseas candidates one copy) should be forwarded by 8 March 1979.
Please quote reference No. 3205

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SOUTH WEST UNIVERSITIES COMPUTER NETWORK
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The Regional Computer Centre (SWURCC) is part of an integrated computer network of university institutions in the South West of England, and South Wales.
The Centre has an ICL 2980 with a 48 kb link to the Network.

APPLICATIONS & USER LIAISON

A vacancy exists in the team which has responsibility for the implementation of applications packages on the Centre's 2980 and for providing liaison with and general support to the five university institutions ... the 2980.

... :

- a sound programming background, probably in a scientific programming environment
- ability to communicate well, verbally and in writing
- ability to establish good working relationships with staff and users
- enthusiasm

Graduate qualifications or equivalent are required.
Salary £3883 to £6555 per annum (under review).
Application forms and further particulars from the Personnel Officer, University of Bath, BA2 7AY (tel. Bath 61244 ext. 700) quoting reference number 79/43. Closing date will be 5th March.

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Applicants should have considerable experience in real-time and on-line systems using mini computers. A good knowledge of high level languages such as CORAL 66 is also desirable. Initial assistance with temporary housing may be available.

Application form and further information from: **The Chief Constable, Personnel Department, Devon & Cornwall Constabulary, Middlemoore, Exeter EX2 7HQ.**

Closing date for completed application 26th February, 1979

SOCIAL SCIENCE RESEARCH COUNCIL

Database Management Systems Fellowship

Applications are invited for a two-year senior fellowship for work on the potential for social science research of database management systems in particular based on relational DBMS. The successful applicant will be expected to liaise with SSRC and to report on further steps needed to advance this field. Qualifications sought are a high level of ability in mathematics and statistics, knowledge of computing software; interest or training in the social sciences and willingness and ability to understand social science needs. The appointment is expected to take effect from October 1979. The salary will be up to professorial level but an appointment may be made at a more junior level, if appropriate. Payment of additional supporting expenses is negotiable with SSRC, the successful applicant, and the proposed institution. Applications close on 1st February, 1979.

For further information contact Barbara Hart, SSRC, 1 Temple Avenue, London EC4Y 0BD Phone (01) 353 5252 ext. 67.

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Mr. Jelley, Computer and Records Officer, Extension 32, will be pleased to discuss this post with a suitable applicant prior to an interview being arranged.

Application forms are available from and interview arrangements can be made by contacting Miss R. J. Hutteman, Personnel Officer, The General Nursing Council for England and Wales, 23 Portland Place, London W1A 1BA. Telephone: 01-580 8334, Extension 43.

OPPORTUNITIES IN WALES & THE WEST COUNTRY

Go West— it's a great place to live!

By Keith Gay

Keith Gay examines some of the advantages of working in the West Country, but says that the many attractions offered by the area do not include high salaries. Gay is a senior consultant at AB Executive (Bristol) Ltd.

MUCH has already been said about the development and prosperity of the West Country. You have heard about exciting and futuristic developments such as Inmos; the relocation of many major insurance houses; the plans of many in-house installations, putting them among the UK leaders in their field; and the heritage of one of the finest living environments in the UK.

I have therefore decided to delve, in a little more depth, into something fairly close to the heart of everyone — salaries.

Many parts of the West Country have been regarded for a long time by employers already here as "privilege" areas in which to work. They have therefore been reticent to pay salaries which one considers realistic and competitive. In their defence it should be borne in mind that a London "weighting" is operative for many industries and therefore when someone moves westwards, remaining on the same level of salary, it is tantamount to receiving an increase.

It is fair to say that as one moves westwards from London salaries decrease, obviously making Bristol fairly competitive compared to Lands End. During the last 12 months there has been an increase which tends to bring the West Country in line with the majority of other UK provincial centres, if not slightly above.

There are, of course, many compensating factors for any remunerative decrease. These incude lower cost housing than most conurbations; a communications system offering an efficient motorway link to the Midlands, the North and London; easy access to many of the West Country seaside resorts; living as far as 20 miles from a major centre and still only being 30 minutes away from your place of work; not forgetting the high speed train!

Much of South Wales is, contrary to popular belief, very attractive. There are the mining valleys which hold their own attraction for some, but beyond Swansea in the West, attractive beaches and pictorial vistas abound. Wales as a whole is arguably the most beautiful country in Britain, because it has many of the attractions contained in other parts, but on a smaller scale.

There is substantial DP activity in the major centres, but again salaries do not tend to be high. The major compensation is yet again substantially lower cost housing (even lower than many parts of the West Country).

Having said all that, there have recently been a number of exceptionally well paid opportunities, offering not only a stimulating challenge but also an above average salary. If money is the most important factor, however, an analogy may be drawn from house purchase — you have to be in the right place at the right time or to be prepared to wait until the "right one" comes along — that is provided you do not mind being one of 150 vying for the opportunity.

One of our most important and difficult duties is to match salary required to salary offered, and in many instances this difficulty creates an unbridgable gap — a gap which is often the only factor stopping substantial interest being shown on both sides.

Existing company pay structures in an area must be adhered to when someone moves into that area. The company rightly thinks, "What is the point in employing a person who exactly fits the job parameters if it means causing unrest and discontent among loyal employees by paying a higher salary than they are already earning. Is it not better to appoint someone local with not quite the right experience (and at a lower salary) who has the potential to do the job with a little training?"

If you feel that I am painting a gloomy picture, that is not so. I am trying to be realistic and think it far better to present the facts as I see them rather than trying to present a totally false picture.

So come and enjoy the West Country. It is a great place to live, but do not "shoot for the moon" in terms of salary because you may well be disappointed.

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Please apply in writing, giving full details to: Mrs. Janet Shutter, Personnel Officer, Phoenix Assurance Company Limited, Phoenix House, Redcliff, Bristol BS1 6SQ

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ANALYST/PROGRAMMER

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It is expected that the successful candidate will be a graduate or hold a professional qualification at a similar level Some involvement in system design and experience of programming in an assembly language will be preferable Knowledge of ICL 1900 systems and PLAN would be an advantage

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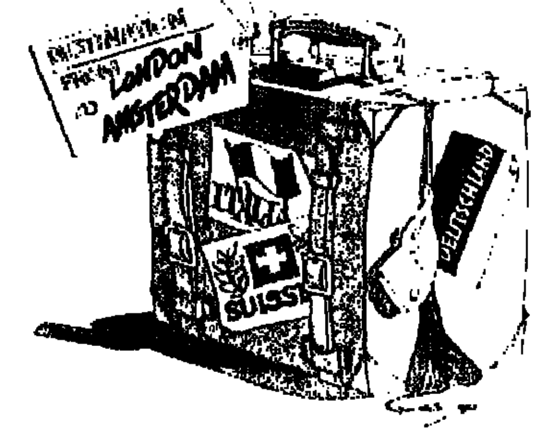


Immediate/Forthcoming UK and European Contracts

Operators

ICL 2903/4 Exec. 1 & 2 Ops.	**IBM** 360 OS/MFTII/HASP Ops.
ICL 2980 VME/B Ops.	**IBM** 370 OS/VS1 & VS2 Ops.
ICL 2960 VME/K Ops.	**FRENCH SPEAKING** OS JCL WRITERS
ICL 1900 GII & GIII Ops.	**IBM** 370 — DOS VS POWER & GRASP Ops.
ICL GIII DATA CONTROLLERS	**DATA CONTROLLERS**
HONEYWELL — OS 2000 Ops.	**TERMINAL VDU** Ops. Varied Contracts

For further details or advice on these or other **U.K.** and **European** Contracts call Sue Smyth, June Mogg or Jane Asbury NOW! on 01-491 4706 or 01-439 3411

Programmers/Analysts

UK	
IBM DOS COBOL — NORTH LONDON	**HONEYWELL** COBOL + IDS — LONDON
IBM IMS.SYSTEMS ANALYST — BERKS.	**ICL** 1900/2900 — LONDON
IBM COBOL IMS — BEDS.	**OVERSEAS**
IBM COBOL — ESSEX	**IBM** OS SYSTEMS PROG. — HOLLAND
PDP FORTRAN — LONDON	**IBM** IMS SYSTEMS PROG. — HOLLAND
PDP ASSEMBLER — LONDON	**HONEYWELL** L66 + IDS — HOLLAND
MINI BASIC — ESSEX	**TECHNICAL** ENG. WRITERS — ITALY
INTEL ASSEMBLER — SUSSEX	**ICL** 2900 VME — MIDDLE EAST

ICL 2900 VME/B COBOL
REQUIREMENTS FOR PROGRAMMERS, ANALYSTS AND SYSTEMS PROGRAMMERS LONG AND SHORT TERM IN UK/EUROPE.

Please contact Richard Kaluzynski, Neil Williams or Suzy Gillam: 01-491 4706 or 01-439 3411

All vacancies are open to both male and female applicants

Knight

Knight Computer Services Limited,
14 Old Park Lane, London W1Y 4NL,
Staff Services Division of BOC Datasolve Group and a member of Computing Services Association.

01-491 4706

£6,500-£9,000p.a. plus company car or allowances

The total support of our software services means complete involvement for Software Professionals with Digital.

When Digital invented the mini computer we started a revolution. More and more businesses and industries are turning to mini computer based systems creating one of the most exciting growth areas in computers today—an area in which Digital are rightly recognised as the world's leaders.

An important part of our success has been the emphasis we place on the high quality software support achieved by our Software Services Division.

Software Services provides vital backup to our sales force and to our customers. They're part of the front line team that maintains our high reputation for professionalism and effectiveness—a team which can call at any time on the substantial resources of the Digital Equipment Corporation.

The increasing demand for our products—mini's, micros and mainframes—means we now need more Software Professionals to join us. We're looking for those people who can provide an effective consultancy service to our customers, particularly those with experience in implementing mini or mainframe systems in a commercial environment. This should have involved you in Systems Analysis, Systems Sizing and Systems Design, Communications and Networks.

You may have gained this knowledge in customer and sales support with a computer manufacturer or in a consultancy role in a software house, or even with a large user. If you can support us with that kind of experience we will support you with a basic salary of £6,500-£9,000 p.a. plus a company car or allowances which can total up to £2,000 in Central London.

You'll like the atmosphere we've created at Digital, too. We're a progressive, modern informal and highly professional organisation—one which has managed to combine tremendous commercial success with the all important human touch. Personal and professional development is actively encouraged and, because we're rapidly expanding and people oriented, promotion prospects are excellent.

Please write with sufficient details to make an application form unnecessary, to Ken Lanham, Digital Equipment Co. Ltd., Digital House, 252/256 Kings Road, Reading, Berks. If you prefer, telephone him on Reading (0734) 599049. Please quote ref. 511.

digital

I NEED 2 MORE RECRUITMENT CONSULTANTS

c. £5K basic plus profits

Because my division is overworked, I need one or two more consultants to join this happy, extrovert team.

If you fancy a change of pace and direction and have

a broad understanding of the computer industry
an outgoing, energetic personality
enjoyment in meeting people
a strong motivation for selling
and a desire to make money
then book an appointment to interview me — Derek Pearson

MANAGEMENT & EXECUTIVE SELECTION
Suite 201/6 Albany House, 324 Regent Street, London, W1 ● 01-637 9611

Experienced professionals & graduate trainees

Computing opportunities in a sophisticated environment

In the range and scope of its advanced computer technology, central government, as the country's biggest user, is unrivalled. The installation of sophisticated hardware and software systems has brought about greater speed, efficiency and accuracy on all fronts; today government departments operate some of the largest real-time systems in Europe and also use highly specific computing facilities to aid scientific research and the task of large scale management. The potential for further applications is tremendous, and new systems are continually being implemented.

For both the experienced professional and the graduate who enjoys solving problems and is considering a career in computing, few areas can rival the opportunities offered by the London-based Central Computer Agency — the service responsible for ensuring efficient use of computer systems in government and other areas of the public sector. There are currently vacancies in its Technical Services Division, which is involved in researching and assisting in the development of new methods, techniques and applications; evaluating hardware, software and total systems; providing advice and assistance during the whole life of projects, from feasibility study through implementation to operation; and accepting systems for government departments. The work involves contact with manufacturers and similar overseas organisations and a close involvement in computer application projects within government.

A first-class training is available to suit your previous experience and to prepare you for specific specialist responsibilities and wide-ranging project support functions.

For the senior posts candidates must have a degree (or equivalent qualification) in a relevant discipline eg electrical engineering, computer technology, mathematics, physics, chemistry etc. They should preferably be under 30 and must have at least 2 years' professional experience including experience of modern computer systems and associated equipment. Starting salary between £4790 and £6200 according to qualifications and experience. *Ref T(41)86/5.*

For graduate trainee posts candidates, preferably aged under 26, must have (or obtain in 1979) a degree in engineering or a numerate discipline or equivalent qualification. Starting salary at least £4150. *Ref T/8963/5.*

Good career prospects to £11000 and above. Non-contributory pension scheme.

For further details and an application form (to be returned by 9 March 1979) write to Civil Service Commission, Alencon Link, Basingstoke, Hants, RG21 1JB, or telephone Basingstoke (0256) 68551 (answering service operates outside office hours). *Please quote appropriate reference.*

Datasolve Datasolve

Programming/ Analysis

A Client is in the process of opening two new divisions to enhance it's rapidly expanding systems and programming division based in the West End of London. The configuration consists of a Univac 1100/80 running under Exec 8, applications are varied and very interesting and the opportunity of developing both On Line & Database experience must be an attraction. Requirement:

2 x Analysts £6,500–£7,500
4 x Analyst/Progs (COBOL) £6,000–£7,500
2 x COBOL Programmers £5,000–£6,250
2 x Jnr Programmers £4,000 plus.

REALTIME PROGRAMMERS Hants. £5,000–£7,500
Our Client is probably the leading computing and systems consultancy in the UK. With offices across Europe and the USA they are offering exceptional vacancies for realtime programmers to work on an exciting range of major projects in almost every application area and on every significant hardware range. If you have 2 years+, sound experience, and see yourself at the forefront of the industry with equivalent rewards, then these openings could put you with the leaders.

For more information phone Andy Mogg.

Operations

IBM 370/148 OS/VS1
Large American banking company, situated in the City are looking for a bright Operator with a minimum of 18 months experience of OS VS1 3 shift system. Holidays are 17 days per annum, 40pf VDU Duty. Banking perks include: personal loan after 1 year, low interest on mortgage after 1 year and cheap BUPA membership.
SALARY £4,500 incl.

Honeywell 66/80, Liverpool (4 x HW66, soon 8)
A popular mail order company in Liverpool are looking for 2 or 3 Senior Operators with at least 4 years experience on the above, or similar, machines. The suitable candidates would have control as either a Senior Operator in a large installation or as a Shift Leader in a medium sized shop.
All relocation expenses will be paid.
SALARY £5,300+ a generous bonus scheme

IBM 370/158 OS/VS1
A large oil company situated in S.W.1 are looking for a good trainee Operator. The suitable candidate would have taken a TOPS course or a similar training scheme and would be aged around 18 or 19. The applicant must be prepared to work 12 hour shifts but the salary is rewarding — company benefits such as 4 weeks hols, £3 L.V.'s a week, pension scheme, interest free season ticket loan, social club and more.
SALARY up to £4,500.

ICL 2904 Exec 1 & 2
A well known car ferry company in Dover are URGENTLY seeking a Senior Operator with around 3 years experience on an ICL 2904, although ICL 1900 experience might be considered. The candidate would be working 2 shift system. Lots of perks such as unlimited free travel across the Channel, 1 free trip a year with a car pulling a boat or caravan, free life assurance+much more.
SALARY c£4,000.

IBM System 3 Model 12
An Electrical/Mechanical Engineering company in Croydon, Surrey, are looking for an Operator. A minimum of 6 months experience preferably on a System 3, is required. The hours are 8.45 — 5 p.m. — flexi. 4 weeks Hols. subsidised staff canteen, and a contributory pension scheme.
This is an ideal opportunity for someone to further their experience.
SALARY up to £4,000.

For more information phone Elaine Collis or Sally Oliver.

All vacancies are open to both male and female applicants.
Phone Andy Mogg anytime, or for an application form leave your name and address with our answering service.

01-491 4706 24 HOUR ANSWER PHONE

OR WHEN BUSY 01-439 3411
ALTERNATIVELY PHONE ANDY MOGG AT HOME ON 01-998 8464.

Knight

Knight Computer Services Ltd.
14 Old Park Lane, London W1Y 4NL.

Staff Services Division of BOC Dataserve Group and a member of Computing Services Association.

JUNIOR OPERATORS

...THIS COULD BE YOUR CHANCE TO MAKE THE GRADE.

SIX MONTHS Operating experience on any mainframe is the qualification necessary for these positions. We are particularly interested in those who feel cramped by the inadequacy of their current hardware and, despite only being involved in the industry for a short space of time, are looking to move into an installation of advanced technology and outstanding career prospects.

Our client offers a fully operational ICL 2980 under the control of VME/B operating system and making extensive use of database and teleprocessing facilities. It is a highly sophisticated operation, one of the most advanced you are likely to find.

With a continuing effort to substantially improve the systems, our client can confidently predict a high degree of job interest and a continued career path.

Starting salaries will be in the range £3000-£3500 plus SHIFT ALLOWANCE. The operation is based on a Social TWO-SHIFT system and additional benefits include NON-CONTRIBUTORY PENSION SCHEME, 4 WEEKS' HOLIDAY and SEASON TICKET ADVANCE. The Location is CENTRAL LONDON within easy access of Public Transport. For further information and immediate appointment for interview contact REF: MT/380 at:

D.P RECRUITMENT LTD.,
KENT HOUSE, 87 REGENT STREET, LONDON W1R 7HF.
TEL: 01-437 2062/3/4 (24-HOUR ANSAPHONE)

PARAMIN, LTD.

SYSTEMS PROFESSIONALS

SALARY TO £10437.42

Paramin (U.K.) Ltd., being the recently formed subsidiary of a prestigious American systems house, wish to recruit highly qualified professionals, who feel that their expertise and ambitions may be more fully realised in an informal but professional organisation.

Remuneration:
We agree that the figure indicated above, whilst being realistic, also served to attract attention. This level of salary is certainly payable to the right people, in fact, exceptional expertise will warrant exceptional salary in excess of £11,000 per annum.

Opportunity:
Being a newly-formed company, scope for personal expansion is only limited by personal ability, the company intending to open further British offices in the near future. For this reason, we wish our staff to not only be highly qualified technically, but also to possess a good level of business awareness.

Location:
Location of business premises is currently undergoing investigation in both the Maidenhead and Guildford areas.

Travel:
The majority of our projects are located within easy commuting distance of our office. However, for those so inclined, we can offer opportunities for travel in Europe, North America and Japan.

Ideally, the people who work with us will meet most of the following criteria:

- Degree in a science subject.
- In-depth knowledge of DEC hardware and software.
- Substantial experience with system design.
- Expertise in leading a communications design team.
- Serious interest in the microprocessor industry.
- Skill in at least two Assembler languages.
- Minimum of five years' industry experience.
- Consultancy experience.

If you feel it is worth discussing our company, call NIALL DUGGAN on (04862) 20261 to arrange an informal meeting.

Paramin (U.K.) Ltd., South Close, Horsell, Woking, Surrey GU21 4TB.

REUTERS REUTERS REUTERS

Top-Downers (wanting to go up)

The impact of the electronic computer on telegraphy, telephony, and other forms of electrical communication has created a fusion of technologies which is having a profound effect on information processing.

As a major world news organisation, Reuters is continually exploiting the development of mini-computer based systems that best serve the needs of the business world.

Our immediate need is for programming staff with 2 to 5 years experience in real-time communications, mini-computers, or software design. Ideally we would like to hear from applicants with experience of RSXIIM or RTL/2 but if you do not have this experience we will train you.

Our salaries are competitive and match individual qualifications and experience. Career prospects are excellent and if you have the flair to become a top-notch top-down designer you could expect to earn up to £10,000 within a reasonable period of time.

If you require more detailed information please telephone Mr Jones or Mr Lathleiff on 01-353 7161, or write or telephone for an application form to:

Recruitment Executive
REUTERS
85 Fleet Street, London EC4P 4AJ
Telephone 01-353 7349
(This is a 24 hour answering service)

REUTERS REUTERS REUTERS

Lloyd's Register of Shipping

FORTRAN PROGRAMMERS

Salary up to £6,500

We offer excellent opportunities to work on a wide range of computing hardware and software.

Programmers with 1 to 4 years' experience in technical applications are required to work within Groups on the development and support of computer applications for the Engineering, Offshore and Shipbuilding industries.

Applications are invited from Honours Graduates with experience in at least one of the following areas:

Picture Processing
Finite Elements
Computer Graphics
Numerical Analysis
Computer Aided Design
Structural Engineering

Please phone or write for an Application Form, marking the envelope "Confidential" to:

The Recruitment and Staff Relations Officer
LLOYD'S REGISTER OF SHIPPING
71 Fenchurch Street, London EC3M 4BS
Tel: 01-709 9166 Ext. 531 or 509

WESTMINSTER MEDICAL SCHOOL
(University of London)

COMPUTER PROGRAMM

Applications are invited for two vacancies which will [illegible] for a new programmable terminal at the School.

Programmer B Salary £3,860-£4,345

The successful candidates will be responsible for the [illegible] of the terminal, advising staff how best to use the [illegible] facilities, and for supervising the work of the junior [illegible]

A degree in science, mathematics or engineering [illegible] knowledge of Fortran is essential. Statistical [illegible] assoc.

Programmer A Salary £3,468-£4,10[illegible]

The successful candidate will have over [illegible] experience, preferably in Fortran, and [illegible] applications programs on their own initiative.

Applications should be sent to The Secretary, [illegible] School, 17 Ronsferry Road, London SW17 [illegible] enclosing a curriculum vitae and the names [illegible]

ANALYSTS/PROGRAMMERS
London **to £7,500**

IBM Anaylsts/Programmers with a minimum of 3 years COBOL experience in an OS environment are urgently required by our clients, a London based International bureau. They offer challenging and rewarding jobs for self starters to develop and enhance advanced modelling systems. The conditions for employment are excellent and there are ample opportunities for advancement.

Ref: 7/1

IBM HARDWARE ENGINEERS
Bahrain **to £9,000 + tax free**

Our clients, an International Computer Services organisation urgently requires a main-frame IBM hardware Engineer to provide maintenance and support services for installations in the Middle East. The successful candidate will be expected to be a self starter and the company offers an excellent remuneration package.

Initial interviews will be held in London during February and March.

Ref: 7/2

HAVEN HAVEN HAVEN HAVEN HAVE

SOFTWARE SPECIALISTS
Surrey **to £8,000+**

If you have a minimum of 1 year's programming experience, preferably on mini-computers and a good academic background then our clients specialising in mini/micro, real-time applications, can offer you interesting and varied projects developing scientific, technical and software products. These positions offer challenging and varied opportunities for ambitious people.

Ref: 7/3

ANALYSTS and PROGRAMMERS
Herts **to £7,000+**

This is a first class opportunity for RPGII/COBOL Analysts and Programmers to join a recently formed D.P. department developing commercial systems on an ICL 2903 in an on-line environment. For the junior positions at least 1 year's commercial experience is required while for the senior positions some systems analysis experience is essential.

Ref: 7/4

HAVEN HAVEN HAVEN HAVEN HAVE

PROJECT LEADERS
London **to £7,500**

A financial services organisation seeks Analyst/Programmers with experience of BASIC on PDP11 equipment to join their team, developing on-line, real-time banking systems.
Previous experience of team leadership, together with some commercial systems analysis is desirable together with the ability to communicate with users at all levels.

Ref: 7/5

COBOL PROGRAMMERS
London/Holland **to £15,000**

An expanding U.K. based consultancy requires COBOL Programmers, educated to degree standard with a minimum of 2 years' commercial programming, preferably with some team leadership experience, to develop financial systems on a wide range of machines. There are excellent career prospects within the organisation and successful applicants will be expected to work in Holland for limited periods.

Ref: 7/6

HAVEN HAVEN HAVEN HAVEN HAVE

ANALYSTS/PROGRAMMERS
Saudi Arabia **to £11,000 tax free**

An expanding computer services organisation seeks Analyst/Programmers with at least 5 years' experience on mini-computers and a COBOL programming background to join their new division providing turnkey systems. The company offer excellent career prospects together with an attractive remuneration package. Initial interviews will be held in London in February.

Ref: 7/7

MINI/MAINFRAME PROGRAMMERS
W. London **to £7,500**

Our clients an established British Group of Companies, seeks Programmers, Senior Programmers and Programming Consultants to provide software house services on mini and mainframe machines.
Preferred experience includes IBM, ICL, Data General and Nova with some commercial programming experience.

Ref: 7/8

INFORMATIX UNITED KINGDOM AND OVERSEAS INDEX

Haven Informatix Limited

24 Grays Inn Road London WC1X 8HR Telephone 01-831 6055 Telex 299539 HAVEN G

SENIOR MANAGEMENT

SYSTEMS ANALYST	**CITY**	**£10,000**	Major international banking organisation has additional position for person with good ICL financial systems experience.	2068/SM
SOFTWARE DEVELOPMENT MANAGER	**W. LONDON**	**£10,000+**	International manufacturer seeks person for systems software environment. Building standard software with emphasis on quality. Suit manager with technical experience either with manufacturer or softwarehouse	2089/SM
SYSTEMS SUPPORT ENGINEERS	**EUROPE**	**£10,000+**	LONDON – based systems engineers for overseas client. Technical advice, planning and implementation IBM compatible mainframes.	2055/SM
PROJECT LEADER	**CITY**	**£9,500**	Development of major international message switch systems. Project management coupled with MACRO/ASSEMBLER, RSX and RTL experience. Overseas travel opportunities if desired.	2103/SM
SENIOR BUSINESS ANALYST	**CITY**	**to £9,300**	Evaluation, preparation of revisions and re-issues of systems strategy and project management. Must have good systems analysis and business experience.	2105/SM
PROJECT LEADER	**ESSEX**	**£8,000+ RELOCATION**	This European group has opening for person with leadership ability from ANY environment to work in real-time business and mini computer systems.	2051/SM

IF YOU WANT TO KNOW MORE ABOUT THESE POSTS OR ANY OF THE MANY OTHERS WE HAVE AVAILABLE — THEN RING OUR SENIOR MANAGEMENT DIVISION FOR FURTHER DETAILS.

SYSTEMS AND PROGRAMMING

PROGRAMMER	**N. LONDON**	**£7,500 + +**	Good IBM PL/1 programmer, hopefully with some exposure to systems design to become involved in project management in commercial systems	REF 2056/SP
ANALYST	**HANTS**	**£7,000+ BONUS**	Nicely situated — easy access to South Coast and London. Major IBM installation seeks analyst with min. 2 yrs commercial experience on large machines.	
ANALYSTS	**KENT**	**£7,000 NEG.**	Excellent opportunity to join IBM 370 installation with T.P. monitor. All new development work on financial systems — exciting plans for future	REF 2087/SP
ANALYSTS	**CENTRAL LONDON**	**to £7,800 + BONUS + PERKS**	Rapidly expanding company with ICL hardware seeks systems analysts to work on major batch-processing systems. Co. have exciting plans to evaluate new machinery, more into communications and double D.P. dept. FANTASTIC PROMOTION PROSPECTS.	REF 2102/SP
ANALYST	**SURREY**	**£6,500 + SUB MORTGAGE/ PERKS**	Analyst with good insurance business acumen and experience on ANY LARGE mainframe and perhaps involvement in major systems.	REF 2099/SP
PROGRAMMERS	**LONDON**	**£7,000+ PERKS**	Major IBM installation utilising CICS and database seeks PL/1 and/or ASSEMBLER programmers.	REF 2043/SP

FOR EVERY ANALYST OR PROGRAMMER WE HAVE AN EXCELLENT VARIETY OF EXCITING NEW JOB OPPORTUNITIES — WHY NOT TELEPHONE OUR SYSTEMS AND PROGRAMMING DIVISION TO SEE WHAT WE HAVE FOR YOU?

TRAINING OPPORTUNITIES

PROGRAMMERS	**N. LONDON/ HERTS**	**to £6,500**	Have COBOL — Learn PL/1. Major IBM 370 installation with excellent opportunities.	REF 2020
PROGRAMMERS	**LONDON**	**to £6,000**	Do you want to get on to large IBM mainframes? — 18 months' COBOL on any hardware is all you need for this major oil company.	REF 2086
PROGRAMMERS	**ESSEX**	**to £5,000+ MORTGAGE**	Fantastic opportunity to get involved with BIG BUSINESS FINANCE, BANKING with this go-ahead company. 12 months' COBOL? Then phone NOW.	REF 2098
PROGRAMMERS	**CITY**	**£5,000+ NEG**	If you have 18 months' any MINI ASSEMBLER — then this major international company with extensive DEC PDP hardware will train in up-to-date technology and new software.	REF 2104
PROGRAMMERS	**LONDON**	**£5,500 + MORTGAGE**	This major BANK offers amazing PERKS to prog with 18 months' ICL COBOL exp. They are awaiting delivery of 2980s. All NEW development work. Do yourself a favour — PHONE NOW.	REF 2094

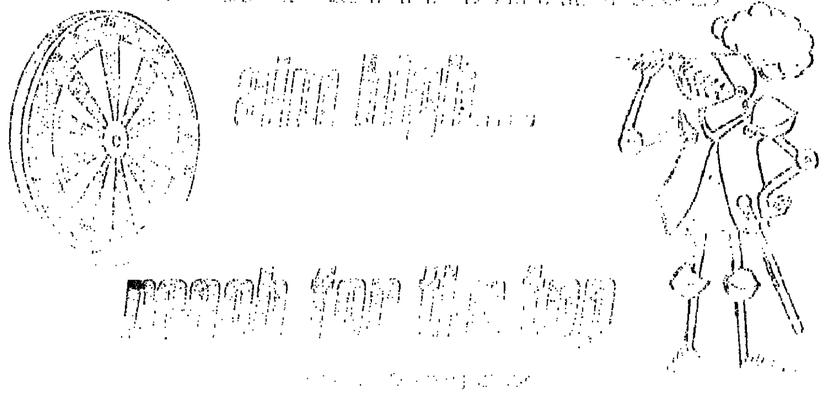
EXPERIENCED PROGRAMMERS WITH A DESIRE TO LEARN NEW TECHNIQUES AND BECOME INVOLVED IN DATABASE, T.P. AND EVEN SYSTEMS — SPEAK TO OUR EXPERIENCED RECRUITMENT CONSULTANTS WHO WILL BE ABLE TO GIVE ADVICE WITHOUT OBLIGATION AND PUT YOU ON THE ROAD TO A NEW CAREER.

Computer Selection Agency

KNIGHT PROGRAMMING SUPPORT LIMITED

ROYALTY HOUSE, 72 DEAN STREET, W1. 01-734 0152/3010 (24 hrs.)
RECRUITMENT AGENCY

KNIGHT PROGRAMMING SUPPORT LIMITED



£240.00	PDP RSX11M MACRO 11 Process Control	**Herts**
£200.00+	Honeywell 66 GCOS COBOL Analyst/Progs	**Surrey**
£240.00+	Honeywell 66 GCOC Analysts	**Surrey**
£210.00+	ICL 1900 GII/2900 VMEB CONV Progs	**C. London**
£250.00	IBM DOS/VS CICS Assembler System Programmer	**Sth. Coast**
£220.00	IBM OS COBOL Programmers	**Sth. Coast**
£230.00	PL/1 IMS DB/DC OS Programmers	**W. London**
£220.00	IBM DOS/VS CICS Assembler	**Surrey**
£220.00	Burroughs 6700 COBOL	**Surrey**
£210.00	DOS/VS COBOL/JCL Exp. Programmers	**Herts**
£210.00	DOS/VS COBOL/Assembler Maintenance Programmer	**Herts**
£400.00	INTEL 80/80 RAP Assembler Programmers	**Holland**
£400.00	Micro Code Programmers AMD 2900/2903 Exp. Pref.	**Belgium**
£375.00	PL/1 IMS MVS Programmers	**Holland**
£375.00	DOS COCS COBOL Programmers	**Holland**
£330.00+	Honeywell OS 2000 COBOL Programmers	**Holland**
£375.00	Univac 1100 COBOL/Assembler	**Belgium**
£375.00	ICL 1900/2950 VMEB/K Conv. Programmers	**Holland**
£325.00+	Honeywell 66 GCOS COBOL	**Holland**
£450.00	Systems Programmer MVS JES II	**Spain**
£ Exc.	Systems Programmer OS/VS1	**S. Arabia**
£375.00	PDP Fortran or RSX 11 M/MACRO II March/April start	**Belgium**
£450.00	Honeywell GMAP Software specialists	**Holland**

Ring Christine Kay/Dave Hayton, 734 0152/6 (24 hours)
Royalty House, 72 Dean Street, W.1
MIDLANDS & NORTH ENGLAND

IBM

- IBM/HONEYWELL PROGRAMMERS ..... c.£230 MIDLANDS
- CICS COBOL PROGRAMMERS ..... c.£230 NORTH, MIDLANDS
- CICS PL/1 DL/1 PROGRAMMERS ..... c.£230 NORTHWEST, MIDLANDS
- IMS COBOL PROGRAMMERS ..... c.£230 MIDLANDS
- IMS DB/DC PL/1 PROGRAMMERS ..... c.£230 MIDLANDS, NORTH WEST
- 370 COBOL PROGRAMMERS ..... c.£220 MIDLANDS, NORTH

ICL

- 1900 GII/GIII COBOL PROGRAMMERS .... c.£215 NORTH, MIDLANDS
- 2960/70 VMEB/K FORTRAN PROGRAMMER c.£220 NORTH
- 2903 COBOL PROGRAMMERS ..... c.£220 NORTHWEST
- 1900 FILETAB/COBOL PROGRAMMERS ... c.£220 NORTHEAST, NORTHWEST, MIDLANDS

OTHERS

- HONEYWELL COBOL PROGRAMMERS ..... c.£220 MIDLANDS, NORTHWEST, SCOTLAND
- HONEYWELL L66 PROGRAMMERS ..... c.£220 MIDLANDS
- UNIVAC COBOL PROGRAMMERS ..... c.£220 NORTH, MIDLANDS
- PDP 11 BASIC PROGRAMMERS ..... c.£220 MIDLANDS, NORTHWEST
- BURROUGHS PROGRAMMERS ..... c.£230 MIDLANDS, NORTHWEST

For details of these and other contracts please contact Perry Butler/Judy Lees on 061-833 9341/5

OFFICES: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM, LONDON

NATIONAL ACCOUNTANT MANAGERS

INTELLIGENT TERMINAL SYSTEMS
DISTRIBUTED PROCESSING COMMUNICATIONS

Incomes c. £17K **Excellent Gurantees — Co. Car**

Our clients are a division of a Multi-National, million pound turnover, conglomerate. Investing in excess of £35 million p.a. on research, they have developed an exciting and powerful range of terminals and communications systems which are already proving highly successful.

The company is embarking upon a massive expansion programme, which by 1980 will catapult them to the forefront of the market place.

New products about to be launched and future plans will ensure not only very large incomes for successful candidates, but also excellent career prospects. It is intended that the initial intake of new personnel will form the management structure over the next year or so. Candidates should therefore have the potential to move into a more senior position within a relatively short time scale. Indeed, there is currently a SENIOR MANAGEMENT opportunity available, and all relevant applicants will be considered for this position.

We are interested to hear from applicants who have a sound business sense, capable of negotiating multiple sales at a high management level, with the drive and ambition to really succeed in this very lucrative market place.

Successful candidates will be offered a basic salary of between £6K and £8K (more if you can justify it), substantial income GUARANTEES and a genuine income potential of circa £17K. A company car or allowance will be provided plus other excellent fringe benefits.

This is a REAL opportunity for 1979 and beyond — DO NOT IGNORE IT!

BANKING AND FINANCE

Incomes C. £17K

We are seeking experienced Salesmen with a good track record working within one or more of the following sectors: BANKING — FINANCE — BUILDING SOCIETIES — INSURANCE. Experience gained within the Computer industry in general is essential, but a knowledge of terminals or distributive processing or communications would be a distinct advantage.

GOVERNMENT

Incomes c. £15K

Our main requirement is for personnel who understand the working of the C.C.A. and who are accustomed to negotiating high value multiple contracts.

MAJOR ACCOUNTS

Incomes c. £15K

An unparallelled opportunity exists for candidates with a sound business sense capable of negotiating multiple sales at a high management level with the "Times Top 1000" companies.

Experience of Distributed Processing or terminals would be an advantage, but not essential.

For a confidential discussion please telephone or write to the advising consultant quoting Ref. No. DVW 79/4.

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REF. No. JFEG-3

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1 DISC DRIVE
Specialist, who will be an in-depth Technical Expert on Drives and Controllers with specific knowledge gained in an IBM 360/370 environment.

2 PROCESSOR
Specialist, specifically with in-depth IBM mainframe experience, to work within the ADD on MEMORY section, where the need for processor knowledge is paramount.

3 COMMUNICATIONS
Specialist, who will have in-depth general background in all aspects of Data Communication, and although this position does not demand in-depth IBM experience, a knowledge of S.D.L.C. and S.N.A. would prove advantageous.

You will be working for a large and prosperous Company who can offer excellent career opportunities for ENGINEERS a mature outlook and the ambition to capitalise on their specialist knowledge.

In the first instance call us quoting Ref. JMC/9.

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1 Teaching others to make the grade

or

2 Supporting those who haven't yet gained your experience.

We have been retained by a large British Mini Computer Supplier, with their sights fixed firmly on the future to find Hardware experienced, Lecturers and Technical Support Personnel. We can offer genuine career opportunities. Salary of £6-£8K plus profit sharing and a Company Car to the right people.

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★ Have you managed large/medium Computer Projects?

★ Can you plan and control: Targets, Budgets, Resources, Timescales, Contingency, Customers, Suppliers.

★ Are you achievement orientated?

THIS IS A LARGE COMPUTER MANUFACTURER WITH IMPRESSIVE IDEAS AND PLANS FOR THE FUTURE

★ Are you interested?

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Please telephone or write to the Senior Consultant. Ref. JFEG-4.

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BASIC—5% COMMISSION—£12K to £18K— CAR

Based London and Home Counties

ARE YOU CURRENTLY SELLING c. £200K OF SMALL/MEDIUM BUSINESS SYSTEMS/APPLICATIONS?

WILL YOU EARN circa £16K+ THIS YEAR?

If you believe you have the skills and experience to match our clients' requirements and really want to become an integral part of a rapidly expanding organisation — "that's really going places," (new offices in Birmingham and London this year), then call me — David Wilkinson — now.

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"The ladder to success is through selling"

"Get into sales, get to the top"

"Most top people started in sales"

It's true, we've proved it!

Many of our friends now Company Directors/General Managers, began their career as an Engineer or Programmer, and owe their position today to a successful sales record.
Have you considered a sales career? You will need two important ingredients; the will to succeed and an organisation prepared to provide professional training. We have the experience to identify your sales potential, and a client prepared to offer formal training to enable you to capitalise on your potential.

Our clients are a multi million ££ BRITISH company — MARKET LEADERS in their field — enjoying outstanding business growth.
The investment they are prepared to make in your future include: a base salary of at least £5K, substantial income guarantees, company car, and an income potential of c. £15K after training.
You should be aged between 22 and 35, articulate, numerate, and "open minded" enough to talk to our career adviser for an immediate assessment and, if successful, an introduction to our clients.
Telephone immediately for a discussion — Ref. DS-4.

Insight Marketing & Personnel Consultants Ltd.
72-75 Marylebone High Street, London, W1M 4AJ
Telephone: 01-486 5644

ANALYST PROGRAMMERS COBOL

LONDON/HOME COUNTIES **To £8,000+**

One of the world's foremost computer manufacturers is currently seeking career minded talent with experience of or interested in Transaction orientated business systems. Development will be supported by the company's own T.P. monitor and database system. Candidates should have a sound commercial background and a good working knowledge of Cobol. This is without doubt a promising career move, with a company whose innovations are held in high esteem world wide. For further details please quote ref. CW230.

COBOL PROGRAMMERS

LONDON & S.E. **£4500-£7500**

A young and highly successful software consultancy with a rapidly expanding order book is now seeking COBOL programmers with around two years' + experience to help consolidate and develop new business in London and the south-east. Projects cover a wide variety of applications, mainly in the commercial sector, and offer plenty of scope to creative career-minded individuals.
For further details please quote ref. CW232.

SOFTWARE DEVELOPMENT

EUROPE

A widely respected Computer Services Company based in central Europe with an impressive track record dating back to the late 50s, is currently seeking highly skilled technical personnel to complement and enhance the company's success in its main areas of application. Ideally they require expertise in IBM mainframe software, i.e. data communications, operating systems, interactive information systems, and basic software development in general, PL/1 and/or Assembler.
All relocation will be paid where necessary and salary should not be a problem. For further details please quote ref. CW231

Edmund Howard & Partners
COMPUTER PERSONNEL CONSULTANTS
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Take advantage of our position as one of the leading recruitment specialists in the field of scientific programming. Today, more than ever, there is a demand for highly skilled personnel with the ability to tackle wide ranging projects in the design and development of scientific systems. If you hold a degree in a scientific discipline or have relevant practical experience of real time mini computer systems, using either ASSEMBLER, BASIC + MACRO 11, CORAL or FORTRAN, then give us a ring quoting ref. CW233.

TECHNICAL SUPPORT PROGRAMMERS

LONDON AND THE SOUTH **£6-£7,500+**

You will play a very important role assisting the sales team of a large international organisation. Responsibilities and duties will necessitate working on client premises periodically, ascertaining and compiling technical specifications which will assist the sales force to successfully accomplish their tasks. Applicants must possess a good commercial D.P. background along with a pleasing and helpful attitude
For further details please quote CW234.

CHIEF OPERATOR

We are an Engineering Group with five operating companies in the Warrington area and we will shortly be installing an I.C.L. 2904/50 Computer.
This new appointment is based in Warrington and we are looking for a person (male/female) with both operator and supervisory experience who can demonstrate that they have the administrative talent to become Operations Manager within 12/18 months of first appointment.
If you have at least two years experience on I.C.L. 1900/2900, 2 years as a shift leader and the self-motivation to utilise and expand a new installation, we would like to hear from you.
The salary for the senior staff appointment will be in the range £4.5K to £5K. There is a contributory pension and life assurance scheme and assistance will be given with re-location expenses, where appropriate.
In the first instance, please telephone for an application form, to:

Personnel Manager,
THOMAS LOCKER (HOLDINGS) LTD.,
Church Street,
Warrington, WA1 2SU
Tel: Warrington 51212 ext. 109.

Locker

PROGRAMMERS YOU NEED TO BE QUITE A CHARACTER TO WORK FOR US

Outwardly, our software engineers/programmers are very much like anyone else's. But beneath their apparently 'standard' exteriors lie talents of a distinctly extraordinary type.

When it comes to engineering software for airborne applications, their super-speed and accuracy ensure that the shortest response times are easily met. They're invulnerable to pressure and the high integrity demands of the software they design.

How do we find such people? Well, it's not as difficult as you might think – there are many programmers who are potentially as special. The problem is that not every company can be the best out of them. But here at Marconi, we make sure that everything is geared to one thing – job satisfaction. The challenges we offer, the working environment and the career prospects all combine to ensure that our men and women can really make the most of a career with one of Europe's top electronics companies.

If you have real-time experience in non-commercial applications, this is your opportunity to prove that you are the sort of person we're talking about. So don't make your identity a secret – contact us now for more information.

Either phone Norma Coulter on 01-499 2030, ext. 3771 or alternatively write to H. E. Batchelder, Marconi Avionics Limited, Elstree Way, Borehamwood, Herts. Please quote reference MA 79015.

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COLAISTE NA HOLLSCOILE CORCAIGH UNIVERSITY COLLEGE CORK

ANALYST/PROGRAMMERS OR TRAINEE ANALYST/PROGRAMMERS — COMPUTER BUREAU

Applications are invited for the above permanent posts. The Computer Bureau provides comprehensive computer services for academic departments and the College administration. Interactive computing facilities are supported by an IBM 370/138 computer and by microprocessing based systems. The IBM 370/138 runs under VM/370 and CMS and is available 24 hours a day, 7 days a week.
The successful candidates will join the Applications Group in the Bureau. The Applications Group works in small teams developing and supporting programs which cover many aspects of the University's activities, e.g. advisory service for users; various administrative applications and specialised programming support for research and teaching work.

SALARY SCALES:
From 1 March, 1979 Analyst/Programmer: £4842-£5970
From 1 March, 1979 Trainee Analyst/Prog.: £4158-£4278

The level of appointment will be determined by previous experience and qualifications. Preference will be given to candidates with a degree or relevant professional qualification.

Application forms and further particulars are available on request (by postcard please) from:
Establishment Officer
University College, CORK, Ireland.
Closing date for receipt of completed applications: Friday, 9th March, 1979.

COMPILER MANAGER

SCOTLAND

The Company is NCR, one of the top 3 computer systems companies worldwide for sales revenue and software development budget.

1978 earnings went up by over 60%, and product plans to continue this growth are exciting and well developed.

Located in Dundee is the nucleus of a group with the potential of making a major corporate contribution in the vitally important field of compilers and other software development tools.

The Compiler Manager will turn this potential into actuality.

Clearly, therefore, candidates must be intimately acquainted with the compiler scene (especially block-structured languages), but equally important, they must be particularly capable of building and leading a team of professionals and holding their own with corporate management.

This is a challenging position demanding exceptional qualities, and NCR management has no illusions as to the market value of the right candidate.

The job will be based in Dundee on Tayside. Housing is economically priced and of a very high standard. Other social amenities — e.g. schools — are of a standard to compare with anywhere in the UK. The company offers comprehensive relocation assistance.

In the first instance, contact, in complete confidence, A. P. BAKER by phone (01-499 4501) or by letter at the address below. He has full details of the company, the job, and the location.

Ref. RW 6/2

PRODUCT MARKETING MANAGER LEADING ★EUROPEAN MANUFACTURER★

The job is to take full business responsibility for a range of established products and to handle new product proposals from start to finish. In addition, the Product Marketing Manager will be expected to develop and co-ordinate detailed business plans, and ensure the total success of all business objectives.

Both depth and breadth of experience in the computer industry are essential prerequisites for success in this job. It is likely that this experience will have been gained in a variety of sales, marketing and technical roles. Maturity, discretion and sound commercial judgment are all fundamental qualities.

The company, located in the London suburbs, is in the vanguard of hardware technology, and intends to enhance this position. This is, therefore, an important appointment and this will be reflected in the remuneration package.

Contact: A. P. BAKER, Managing Consultant.
Ref. 6/1

PROGRAMMERS FOR MICRO PROCESSORS IN THE HOME COUNTIES

Do you ever get tired of hearing — Have you got two years' experience of Cobol/PL-1/Fortran, etc.?

You do? — then how about

—18 months upwards of any high level language
—Retraining to block-structured languages
—Microprocessor applications
—Salary scales to £8K and beyond
—New European software house
—Multinational corporation

Want to hear more? Then phone me, GEOFF MARSH, on 01-499 4501 to arrange an early meeting.
Ref. RW 6/3

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£5,500 - £6,500

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£4,750 - £5,750

Various major clients

Informal interviews next Thursday and Saturday at
Metropole Hotel,
King Street, Leeds
Leeds 450841

Thursday	Saturday
22nd February 1979	24 th February 1979
4.30 p.m. - 8.30 p.m.	9.30 a.m. - 12.30 p.m.

Please ask at reception for Ivor Norton.

If you cannot accept this invitation please telephone to make an alternative appointment.

Ivor Norton Management Services Ltd
Recruitment Consulting Division
P.O Box 63, Copthall Tower House, Harrogate HG11TS. Tel: Harrogate 66628.

Employment opportunities for programmer/analysts in California

USA

Successful applicants will possess as a minimum requirement, working experience in IBM OS COBOL together with associated JCL and dump-reading skills. Of these applicants, preference will be given to those who have experience in on-line IMS (DL/I) programming. Consideration will also be given to OS COBOL experience coupled with any of the following: DL/I data base design, IMS (DL/I) batch programming, CICS, PL/I and Assembler.

Salaries from £7k to £13k depending upon level of experience, plus relocation reimbursement possibilities.

Informal interviews will be conducted in London in a few weeks. Appointments may be made by writing as soon as possible with a curriculum vitae to Payne Consulting Services Inc., 39 Coso Square, San Francisco, California, 94110, U.S.A.

UNIVERSITY OF EDINBURGH
Program Library Unit

RESEARCH ASSOCIATE/ PROGRAMMER

Applications are invited for the above post which is offered for one year in connection with an SSRC sponsored investigation into the optimisation of large programs on ICL 2900 series computers.

The work will involve studying the interaction of the packages with the operating system and the reprogramming of sections of them. A computer science graduate would be preferred but other graduates with adequate programming experience will be considered.

The salary scale is £3384-£4882 per annum.

Further particulars are available from the Secretary to the University, University of Edinburgh, Old College, South Bridge, Edinburgh EH8 9YL, to whom applications should be sent not later than 8th March, 1979. Please quote reference 5007

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SYSTEMS DESIGNERS To £6,800

To design and implement cost-effective applications within the Corporate Systems Development Plan.

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To prepare program structure specifications, and supervise programmers in implementing them.

DESIGN ASSISTANTS To £4,500

PROGRAMMERS To £4,500

To write mainly COBOL, but some FORTRAN.

Free Travel

By rail, to and from work, by bus at all times, including weekends: a saving that could be worth hundreds of pounds a year.

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Some of Britain's most beautiful countryside is within easy reach, including the Lake District, Peak and Snowdonia national parks. And Manchester and its satellite towns offer some of the finest shopping outside London.

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NALGO membership brings you privileges like discounts over a very wide range of goods and services, including car insurance and HP.

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We give you generous help in moving: up to £750 to cover the sale of your old house and purchase of the new, temporary lodging allowance, time to house-hunt, etc. And it's possible to live on the edge of the county only 10 miles from the City centre.

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There's a very lively sporting scene, including cricket (Old Trafford), soccer, rugby, tennis, squash and golf. Real beer. Thriving clubland. Home of the Hallé.

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Send application or request for further information to:
Mr J S Horsfield, Recruitment Manager
GREATER MANCHESTER PASSENGER TRANSPORT EXECUTIVE
2 Devonshire Street North, Ardwick, Manchester M12 6JS.

PROGRAMMER

£4200-£6200 p.a. **Stockport**

The Central Electricity Generating Board invites applications for the above position in its Computer Branch.

The job is in a team which provides a computing service to power stations and involves working on the Region's central computer (ICL 1904S to be replaced by 2960 and 1980) plus location's own machines (Ferranti, G.E.C., D.E.C.) The team is based at Bramhall, Greater Manchester, but assignments elsewhere may take place from time to time, e.g. North Wales or North Lancashire.

Applicants should have 'A' level maths plus two years' appropriate experience preferably on COBOL and/or FORTAN. Knowledge of GEORGE 3 and/or VME/B operating systems and teleprocessing plus REAL TIME experience would be an advantage.

Applications in writing from either sex, giving details of age, experience, etc., to the Personnel Manager, Europa House, Bird Hall Lane, Cheadle Heath, Stockport, Cheshire SK3 0XA, to reach him no later than 21 February, 1979. Please quote vacancy No. 402/CW.

NORTH WEST

THE OPEN UNIVERSITY
DATA PROCESSING DIVISION

COMPUTER OPERATORS

up to £3,900 (including shift allowance)

The University's rapidly expanding Data Centre provides support to the administrative and operational units of the University which now has approximately 70,000 home-based students. Promotions have created vacancies for UNIVAC 1100 Operators and applications are invited from persons over the age of 18, educated to 'A' level standard and who have up to one year's experience of major operating systems.

We offer: Career development opportunities: Training, including day release for computing studies: Good holiday provision: Sport/social facilities: Rural location with houses available to rent or to purchase at reasonable prices.

Application forms are available from **The Recruitment Office (JD3458/3), The Open University, P.O. Box 75, Walton Hall, Milton Keynes MK7 6AL or telephone Milton Keynes 63868 (24-hour answering service).**

Closing date for applications: 2nd March.

Business Systems Analysts

Rural Surrey
c.£8,500, plus significant benefits

Our client is a major British organisation with a turnover currently exceeding £400m and a planned investment in 1979 in mainframes and minis, utilising distributed communications architecture, in excess of £2m.

Operating in a rapidly expanding information systems development environment, the management services division wishes to recruit a number of Business Systems Analysts who will be involved in the investigation, development and implementation of a wide range of financial, marketing, manufacturing, and distribution control systems utilising database, distributed processing and real time technologies.

Our client is interested in meeting people who possess a background of experience in systems analysis, design and implementation coupled with some previous exposure in organisation and methods or programming. He is looking for people experienced in communicating with users, in their own language, and able to translate their needs into documented and specific processing requirements. Where appropriate he will provide adequate training in advanced DP technologies to enable the successful applicants to operate effectively at all levels in these appointments in terms of performance and future career opportunities.

For the more senior positions he would consider salaries above the quoted figure and would thus expect a high degree of DP application systems development knowledge and experience at project leader level.

Applicants should be educated to at least 'A' level in two or more numerate subjects, and possess adequate potential for a full career development into the general or technical management stream.

Depending on the depth and width of experience, successful applicants will be offered excellent starting salaries up to or around £8,500, coupled with a range of significant benefits. Appropriate relocation expenses will be awarded.

TO APPLY, please send a ONE PAGE, handwritten or typed, listing of, name, address, age, marital status, home and office telephone numbers, current salary and employer, employment history, including positions held, roles played, relevant responsibilities, and hardware and software systems exposure to date, to ANTHONY SPURR, Management Recruitment Division, quoting reference number G693. Applications are invited from either sex, and will be treated in the strictest confidence.

BIS Applied Systems Limited
York House, 199 Westminster Bridge Road
London SE1 7UT
Telephone 01-633 0866

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HARRIS COMMUNICATIONS & INFORMATION HANDLING

ELECTRONIC FIELD SERVICE ENGINEERS

Due to rapid expansion of our Customer installed base we are seeking two experienced Field Service Engineers to work in the London Area.
Candidates should preferably have mini-computer experience with a knowledge of Peripherals including Magnetic Tape, Line Printers, Discs and Visual Display Units.

We offer:

- ★ A competitive salary
- ★ A generous London Allowance
- ★ Company Estate Car
- ★ Usual Fringe Benefits

If you are interested in a worthwhile career and working in a challenging environment, please write or telephone to:

Mr. D. Hyams (Field Engineering Manager)
HARRIS SYSTEMS LIMITED
145 Farnham Road, Slough Berks, SL1 4XD
Tel. 0753-34666

USA

PROGRAMMERS
ANALYST/PROGRAMMERS

- $18,000 to $30,000 depending on experience
- In house training programme
- Excellent company paid benefits
- Relocation expenses including return

SDA, a highly respected computer consulting company in 1968, is rapidly expanding in New York City, Chicago and Hartford, Connecticut. We require individuals with a minimum 3 years IBM 370 experience (or equivalent), preferably degree, to join our current staff of 250, for challenging in systems design, applications programming and data
These assignments will be initially for 18-24 months with the possibility of participating in our international on your return.
To arrange a confidential interview (expenses Manchester, send your c.v. with telephone number (reverse charges) Roger Barnes on 0625 [illegible] 13/14/15 between 10am and 8pm.

SOFTWARE DESIGN ASSOCIATES INC
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Computer Weekly
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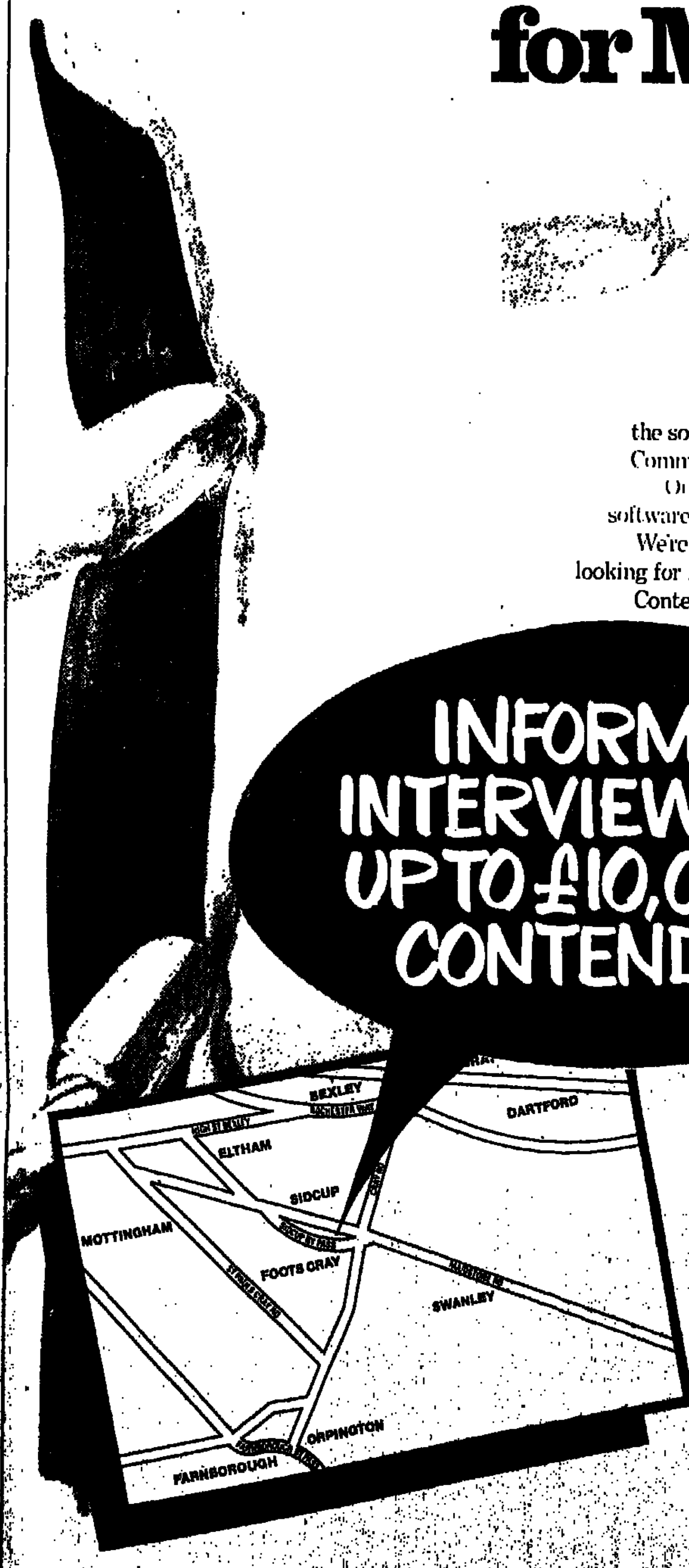
Programmers, Analysts & Software Engineers. We'll show you the ropes in our top European training ground for Middleweights.



It's on the London Kent border at Foots Cray and run by us — IDEC — the software development muscle behind ITT's Business Systems and Communications Group.

Our daily work out involves developing software support systems and producing software for ITT's wide range of products.

We're at the top of our class and because we intend to stay there, we're continually looking for new talent.

Contenders — male or female — must be high level language, DP or Real Time Programmers/Software Engineers with middle-weight experience who have the ambition and ability to move into the heavy-weight class.

We can offer them a substantial purse — worth up to £10,000 p.a. entirely dependent on experience and potential — backed by a full fringe benefits package... featuring 23 days holiday, subsidised meals, flexible hours, pension scheme and big discount on company products.

We can also offer them the chance to further develop their talents and explore their strengths within a tough, competitive, absolutely professional environment.

And to make a name for themselves in 'state-of-the-art' software development.

If you're keen for a bout with a major, successsful company, simply write or 'phone to get the facts.

Contact Keith Gent or Jeff Perry on (01) 300 7788 ext. 3673, or best of all, call in any time between 10am and 8pm on Tuesday 20th or Wednesday 21st February, at: IDEC, ITT Site, Maidstone Road, Foots Cray, Sidcup, Kent.

IDEC and you - an exciting match

IDEC
A Development Centre of ITT Business Systems
ITT

MYRIAD

COMPUTER OPERATOR

W:2 — NO SHIFTS — £3300

If you can offer six months' experience of operating an IBM mainframe, and are now seeking to move into an interesting installation with No Shift working, this position provides an ideal opportunity.

An international advertising organisation is currently seeking an Operator to be responsible for the efficient processing of all production work. The company's H.Q. is at Bayswater, but their computing facilities are based in Brentford. You will therefore need to make regular trips between the two centres for which transport will be provided, and in addition to the normal range of operating duties you will become involved with job make-up and fault tracing in error situations.

This is an ideal opportunity to progress your career within a small but enthusiastic team, and gain valuable experience in an installation which will rely upon your ability and initiative.

Ref. SW1/1502

MYRIAD APPOINTMENTS LIMITED Computer Personnel Consultants
Telephone or write to:- 30 Fleet Street London EC4Y 1AA 01-353 0981 (24 hrs)

Systems Analysts

The Management Services Department at our Group Headquarters in York has openings for:–

Sales and Marketing Analyst

..to carry out non-routine investigations. Recent projects have included assessing the effectiveness of our advertising and merchandising and organising the efficient deployment of the salesforce.

You should have one to two years' experience of systems analysis or related work or have a sales/marketing background and be considering a career in systems analysis.

Personnel Records Analyst

..to work in a team of six on the development of payroll and personnel records systems. We are looking for an analyst with one to two years' experience of systems work. Your particular experience need not be in that area as full training will be provided.

The equipment we are currently using includes an IBM 370/148 and 370/158 although later this year we will be running an IBM 3032 and 370/168. Our main programming language is PL1 and our operating system is VS1.

For both positions we are interested in graduates who ideally have some knowledge of statistics or economics. More importantly we are looking for the analytical, technical and personal skills necessary to carry a project through from an embryonic idea to a functional system. If this can be backed up by imagination, self reliance and an inclination to tackle demanding and challenging projects so much the better.

Starting salaries will be competitive and will reflect current market rates. In addition there are good prospects for promotion within Management Services and into other areas of the company. Other benefits include profit sharing, sick pay and pension and life assurance schemes.

If you are interested in either of these posts, please write or telephone York (0904) 53071 ext. 2011 for an application form, quoting ref. FY.628, to Miss D. M. N. Dick, Staff Office, Rowntree Mackintosh Ltd., York YO1 1XY.

Rowntree Mackintosh

UNIVERSITY OF SOUTHAMPTON
SERVICE SUPPORT PROGRAMMER

Applications are invited for the post of Service Support Programmer in the Computing Service. The successful applicant will join a team who are responsible for the maintenance and development of the Computing Service whose principal resources are a dual processor ICL 2970, a large PDP 11/45 and CDC 7600 machines at Manchester and London. Under current development are campus and regional networks, microprocessors and distributed computing systems. Although no specific experience is required preference will be given to candidates with knowledge of some of the development areas coupled with hardware expertise. Applicants should normally possess a degree or similar qualification but candidates with proven ability and experience will also be considered. The appointment will be in the salary range 1A or 1B (£3384-£6555) per annum. The starting salary will depend on qualifications and experience.

Further particulars may be obtained from Mrs. P. Vaughan-Smith, The University, Southampton SO9 5NH, to whom applications should be sent by 22nd February, 1979. Please quote ref: 1052/A/Co.

COMPUTER OPERATOR OVERSEAS

c. £10,900 in 18 mths.

Please hear about these lucrative bachelor status open contracts with major international company.

01-493 5332

Please just listen, you do not need to speak.

ACCOUNTANT MICROPROCESSOR

Accountant with computer orientation and experience in hardware, ability to develop software as well as general accountancy experience is required to assist in the marketing and development of a young company specialising in microprocessor systems.
Salary from £5,600 negotiable. Send details c.v., to: LYON COMPUTER SHOPS LIMITED, 227 Tottenham Court Road, London, W1.

Administrative Programmer
Rutherford Laboratory

We need a Programmer for administrative applications to join our Computer Department at Rutherford Laboratory. The work involves administration of scientific research sponsored by the Science Research Council.

If you're a 1900/2904 Cobol Programmer, you could be the person to work with our programming team on our current conversion project. We are in the process of rewriting batch programmes on ICL 1906A/S machine to run interactively on an ICL 2904 computer using T.P. and Data Base Software. The 2904 is situated at Rutherford with a link to SRC Central Office at Swindon.

Applicants must be acquainted with PLAN,1900 and/or 2903/4 systems, and be prepared to develop applications of computing hardware, software and graphics resources within the sphere of administrative computing.

Depending on qualifications and experience, grading and salaries are:-

Scientific Officer £3037-£4721
Higher Scientific Officer £4388-£5829

There is also a non contributory superannuation scheme. The Rutherford Laboratory is situated on the Berkshire Downs, about 18 miles south of Oxford. It has its own restaurant and recreational facilities, shops, banking facilities, hostels and further sports and recreational clubs are available on the adjoining A.E.R.E. Harwell site. Assisted daily travel is available from most of the neighbouring towns and villages direct to the laboratory.

Contact Jane Griffiths in the Personnel Group on Abingdon (0235) 21900 Ext. 510 or write to her quoting reference VN775.

Closing date for applications 2nd March 1979.

RUTHERFORD
Science Research Council
Rutherford Laboratory, Chilton, Didcot, Oxfordshire OX11 0QX. Tel Abingdon 21900

The National Coal Board carries out an ergonomics programme which covers all the important ergonomics areas relevant to underground and surface mining operations. The work is carried out in the Ergonomics Branch of the Institute of Occupational Medicine, based at Stanhope Bretby, near Burton-on-Trent. We currently have an opportunity for a

Programmer/Analyst
near Burton-on-Trent

The successful applicant will work on the ergonomics research programme by the development and management of a mini computer system in an environment involving real-time applications and some data processing. Data arises from physiological and physical measurements and environmental investigations and is processed either directly or in pre-recorded form.

Candidates will be familiar with the software and hardware aspects and have an interest in developing the system to other aspects of the work programme. The current specification of the system configuration is: System a) DEC PDP 11/10, 32 K memory, 3 Disc Drives, Analogue I/O module, Digital I/O module, Drum Plotter, Decwriter, A VDUs. System b) DEC PDP 11/10, 24 K memory, Fixed Head Disc, Digital I/O module, Dual Cassette Drive, Teletype. Current operating system is RSX-11M with MACRO-11, FORTRAN IV AND BASIC +. Training and experience of on-line computing, preferably involving PDP 11s, will be required.

Starting salary, depending on experience and ability, will be within the range £4400 – £5750 or £3850 – £5000. Excellent benefits include nearly six weeks' annual holiday excluding public holidays.

NCB Please apply to Area Staff Manager/Secretary, National Coal Board, Scottish Area, Green Park, Greenend, Edinburgh EH17

LOLA
(LONDON ON-LINE LOCAL AUTHORITIES)

provides computer facilities to four London Boroughs. A tp network serving 40 locations is used for on-line interrogation and updating of databases running under IMS/VS. Current equipment is based on a 4-megabyte 370/158 using VS1. A major enhancement of hardware — including an Attached Processor — and conversion to MVS will take place this summer. Currently vacancies exist for:

Database and Application Support
£4,500-£7,100

The Applications Support Group offers the opportunity for experienced programmers to expand their skills without having to become either Systems Analysts or Systems Programmers. The Group's major responsibilities cover

(a) Design, creation, maintenance and performance of databases
(b) Development and support of application-independent user facilities and programs
(c) PL/1 support for Project Development and Maintenance Programmers

The work covers a range of activities from dealing directly with end-user requirements to understanding DL/1 internals.

Applicants will be considered for posts in three salary ranges

£6,465-£7,146
£6,012-£6,345
£4,530-£6,180

IBM and PL/1 experience are necessary—a knowledge of DL/1 would be an advantage. Training will be given where necessary both to fill gaps in initial experience and to keep pace with developments in computing.

For further details of these posts contact Dave Doyle (Applications Support Group Leader) on 01-366 6611 Ext 248 or Tony O'Brien (Systems Manager) on Ext 244

Systems Programmer
£6,000 plus

Technical Support Group already has seven staff busy working towards the conversion to MVS this summer, whilst continuing to support VS1 and IMS/VS. Additional projects include the use of TSO and RJE later this year.

Previous systems programming experience is desirable but not essential as all necessary training will be provided. Applicants should be experienced programmers with at least two years working in a VS1 or MVS environment.

Salary scale is £6 012-£6 345 but consideration will also be given to applicants on a scale of £4,500-£5,800.

For further details contact Noel Sant (Technical Support Group Leader) on Ext 285

Application forms from
Mrs B. L. Dorrington
LOLA
Tower Point North
Sydney Road
Enfield, EN2 6UE
Telephone 01-366 6611 Ext. 276
Closing date for receipt of completed applications is 28th February, 1979

SENIOR ANALYSTS £7-8000
Oil corporation, currently decentralising its computer operations to European and Middle Eastern sites requires analysts with potential to manage a D.P. centre after six months at base. Work will involve accounting, inventory systems and reviewing systems. C. LONDON

PROGRAMMERS To £6500 + car
All levels of programming staff are required for a new DP installation preferably with experience of RPG/COBOL using VDUs. MID-HERTS

SENIOR ANALYSTS To £7500 +
Prestigious international organisation offers opportunity of controlling project teams of analysts on development work. Prospects of promotion to project leadership is envisaged after six months with financial rewards. WEST OF LONDON

PROGRAMMER/ANALYST C. £8000
A leading European service organisation requires three years' experience of programming commercial applications, some systems implementation and knowledge of COBOL and System 10 ASSEMBLER languages for this position. You will assist the DP Manager in system design and implementation, program writing, amending documentation etc. E HERTS

Please phone for an application form

AMES PERSONNEL
Employment Agency Suite 14, Dryden Chambers, 119 Oxford Street, London W1R 1PA. Tel 01-434 1061

Coral 66 Programmers, Analysts
London & H. Counties
£6-8.5K

A British Multinational corporation has several senior openings in their London and numerous Home Counties offices. They require Analysts, Systems Designers and Analyst/Programmers with PDP11 backgrounds. Ideally some of the senior applicants will have military systems backgrounds and/or distributed processing experience. Whilst these positions are permanent there are several vacancies for contract programmers. Salaries and associated fringe benefits will certainly reflect the importance which our client places on the acquisition of these key personnel. Emphasis will be placed on depth of previous experience and stability in job progression throughout your career. Interviews will be held at the clients office closest to your work or home location. Ref M-7/A

IMS (DB/DC) Applications & Systems Prog'mrs
S.W. London & E.E.C.
U.K. £7-9K
E.E.C. £12-15K

An International client with an enviable reputation in the application of IMS (DB/DC) to advanced commercial and technical areas has openings in South West and Central London and the E.E.C. Applications Programmers should have extensive COBOL or PL/1 experience and have worked under IMS for a minimum of 2 years. You will be given every opportunity to develop your skills within an environment which will encourage you to contribute ideas and expertise and where personal recognition is expressed in tangible terms. You will be expected to shoulder responsibility and motivate team members working under your supervision. Salaries will be scaled to reflect not only your achievements to date but also your potential. Serious consideration will be given to applicants who have previous experience of larger financial systems under IMS. Interviews will be held in London as soon as applications are received. Ref M-7/B

Database Designers & Trainees
Central London
£7-9K plus overseas travel

An International client is seeking Database personnel for their London office. They are entering another major expansion phase for which they require additional Database expertise including Project Leaders, Systems Designers, Analysts and Senior Programmers as well as academically high-standard trainees. The former should be skilled in either PL/1, COBOL, Assembler or Mark IV. Both Database and Data Communications experience would be welcome. Applications are varied but include Banking systems, Airline booking and Stock control. Not less than two years D.P. experience will be considered and for more senior positions 4 years is the minimum. U.K. based personnel may have frequent opportunity to travel to Europe and the U.S. (if desired). Salaries needless-to-say are going to be well above the norm in keeping with the client's prestige and the importance which they place on the acquisition of these key personnel. Ref M-7/C

Software Support Analyst
Frankfurt
£12K + car

Would you like to join a major Mini Computer manufacturer in Holland? The company itself is a U.S. based International corporation with offices in five continents. They specialise in the supply of Bespoke turnkey systems based on Mini and Micro processors specifically in the Communications, Message Switching, Network, Process Control and basic software fields. Any Assembler language and experience of PDP11, D.G. or H.P. is desirable. To meet their expansion goals they are creating numerous additional specialist project teams requiring Consultants, Project and Team Leaders, Analysts and Programmers at various levels, specifically a) 5 years plus b) 2-5 years c) Trainees up to 2 years. If the idea of working at the sharp-end of sophisticated technical computer pioneering appeals and joining a very prestigious company is meaningful in your career development then you must give serious consideration to these opportunities. Ref M-7/D

Mini-Micro Software
Holland
£11-16K

An important U.S. International Mini-Computer manufacturer requires for its Frankfurt office a senior Software Support Analyst to assume responsibility for special projects and assist field engineers resolve systems difficulties in addition to evaluating proposals and technical presentations. A certain amount of European and U.S. travel will be called for and a car will be supplied by the company. Product training will be given at the Company's U.S. headquarters. A strong working knowledge of COBOL and Fortran is necessary and experience of either Assembler, Basic, RPG and Systems Programming would be useful. The indicated salary of $12,000 is not rigid, if exceptional experience indicates otherwise. Excellent fringe benefits accompany the package. Interviews will be held in the U.K. as soon as applications are received. Ref M-7/E

Classifieds

N. GERMANY — Mini Assembler analyst-programmers preferably with aerospace or defence background DM48-55,000 p.a. Permanent or 1 year contract available. Ref M-7/F

BASIC PROGRAMMERS with either commercial or scientific backgrounds required by important Central London based Client. Permanent or contract positions available at salaries of £6-8K or £235 p.w. up Ref M-7/G

HARDWARE ENGINEERS (Minis) with a desire to work in the training division of a major Mini computer manufacturer based in Berks. Product training giving in the U.S. Salary up to £8.5K. Ref M-7/H

BRUSSELS — T.P. and D.B. Applications and Software Programmers. Prefer IBM software. Full relocation expenses and vast range of real company benefits whilst salaries to £16K. Interviews at our London office. Ref M-7/I

CICS Analyst Programmer. With either COBOL or Basic experience. Reading based + overseas travel. Salary dependent on experience to £7,250. Financial systems background preferred but not essential Ref M-7/J

BERKSHIRE/HANTS BORDER — Micro specialist (Intel 8080, Zilog Z80) required by turnkey systems supplier. Established U.K. company offers outstanding career positions. Salaries to £8K +. Ref M-7/K

DENMARK + GERMANY — IBM IMS and/or Univac 1100DBMS applications exposure required for early start. Prefer permanent career person but consider contract. Ref M-7/L

GCOS/TDS — Applications Consultants required by major British Systems Group to be based in one of their European offices. Salary £12K + expenses Ref M-7/M

Tel: 01-409 0468

MATRIX

360 Oxford Street, London. W1N 9HA.

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SURREY	Senior Salesman (Minis)	£15,000 package + Car
SURREY	Systems Consultant (IBM Exp.)	£7,500 +
HANTS	Analyst/Progs (RPG II or Cobol)	to £9,000
HANTS	Systems Programmer (IBM Exp.)	£7,000
SUSSEX	Senior Analyst	£5,750-£7,000
SUSSEX	Programmer	£5,500 +
SURREY	Analyst/Prog.	£6,500

CITY OF BIRMINGHAM EDUCATION DEPARTMENT
BOURNVILLE COLLEGE OF FURTHER EDUCATION
Bristol Road South, Birmingham B31 2AJ
Tel (021) 475 8211

LECTURER I IN COMPUTER STUDIES/DATA PROCESSING

The initial contract will be for one year from 1st January, 1979.

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All classified copy should reach our offices no later than Monday preceding Thursday's publication. If proofs are required copy must be supplied 12 noon on a Tuesday.

Ring David Abbey for further details on 01-261 8014

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HARDWARE/SOFTWARE TESTING SYSTEMS ANALYST

BELGIUM, C £25,000 P.A.

The Overseas Recruitment Consultant
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University of London
COMPUTER SCIENCE AND STATISTICS DEPARTMENT

RESEARCH ASSISTANT/ DEMONSTRATOR

UNIVERSITY OF ESSEX

RESEARCH OFFICER IN THE DEPARTMENT OF ELECTRICAL ENGINEERING SCIENCE

Applications are invited for the post of Research Officer in the above Department.

MYRIAD

PROGRAMMERS IN HERTS

SOUTH HERTS **TO £6000**

Programmers with the desire to develop their careers, having already gained approximately 2 years' COBOL experience, should now consider the existing opportunities offered by our client:

- ★ Program development in an ON-LINE environment.
- ★ Involvement with POINT-OF-SALE terminals and mini's.
- ★ Realistic opportunities for progression to SYSTEMS ANALYSIS or TEAM-LEADING on small projects.
- ★ Formal training, where necessary, in specialised software techniques.
- ★ Staff discounts on company products.
- ★ Generous holiday entitlement.

To learn more about these and other development projects, a short telephone conversation could be the beginning of a bright and rewarding career.

Ref. N1/1502

DATABASE DESIGNER

BUCKS **To £7000**

Due to the development of several IMS real-time applications our client is seeking an experienced Analyst or Analyst/Programmer with knowledge of database systems. Functioning in a consultancy role to several applications teams, the successful applicant will gain extensive IMS exposure, together with the opportunity to co-ordinate and influence the design and development of on-line real-time projects.

Applicants should have a sound academic background, and should be capable of original and innovative thinking in relation to the design and use of database software. Experience of on-line systems together with knowledge of data structure analysis would be of particular relevance.

The Company offers excellent conditions of employment, including five weeks' holiday, an excellent starting salary and relocation assistance where necessary.

Ref: E1/1502.

COBOL PROGRAMMERS

WEMBLEY **£5000 to £6500**

If you have approximately eighteen months' sound COBOL experience gained in a commercial installation our client can offer you excellent opportunities for programming career development.

The company has a progressive approach to computer systems development based on its IBM hardware and is introducing a range of on-line systems.

Although IBM experience is desirable candidates with other mainframe experience will be considered. Successful applicants will have the opportunity to use an inter-active programming language for which full training will be given.

Our client offers a considerable benefits package which is commensurate with a highly successful business operation.

Ref. No. NW1/1502.

SYSTEMS ANALYSTS

N.W. LONDON **£5500-£7000**

We are seeking to recruit experienced Systems Analysts with good business skills who wish to consolidate their careers within a major, international organisation. A wide variety of systems, some of which form part of complex, multinational projects, are developed on the latest IBM equipment at modern, purpose-built offices.

The Analysts will be responsible for small systems teams and may be involved in the planning and control of several minor projects running concurrently. Additionally, the Analysts will prepare business proposals/cost and benefits appraisals, co-ordinate project development and estimate project requirements

Employee benefits are commensurate with other major organisations and include re-location expenses, an excellent staff restaurant and a very active sports and social club.

Ref: S1/1502.

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 24 HRS.

Technical Editor

Berkshire £4000+

We need an editor to help produce computer support manuals. The ideal candidate will have at least 2 years' editorial experience that includes contacts with authors and printers. Knowledge of computer systems will be an added advantage, although training in ICL systems will be given.

The position is based in new offices at Wokingham in rural Berkshire, and forms an ideal springboard for a satisfying career with Europe's leading computer company.

Write to or telephone Don Mehl, ICL House, 80 Peach Street, Wokingham, Berks RG11 1PB. Telephone Wokingham (0734) 790512. Please quote reference CW1252.

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The Job: We need a good COBOL programmer with 12-18 months' experience to be immediately productive in our expanding programming team. Preference will be given to candidates with proven skills in communications and/or database techniques.

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Interested applicants should apply to the Personnel Officer for an application Form.

Kirkstall Forge Engineering Ltd.
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Systems Analysts

We are
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We offer
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—22 days holiday
—Continuing training
—Flexible working hours

We require
—A Degree or equivalent Professional Qualification
—A minimum of 2 years experience in the investigation, design and implementation of commercial D.P. systems

If you are interested, write for an application form to:

Mrs. M.C. Pinkerton,
Assistant Staff Controller,
Bank of Scotland,
2 Robertson Avenue,
EDINBURGH EH11 1PZ.
Telephone: 031-337 2488 (extension 186)

BANK OF SCOTLAND COMPUTER SERVICES DIVISION

CORPORATION OF LONDON
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SENIOR PROGRAMMER/ ANALYST

£5,025-£6,093

A newly created position for a person with proven experience in both disciplines. The installation provides an efficient user-friendly environment and has a stimulating variety of different applications and projects which will add to your experience already acquired. Commencing salary will be commensurate with experience.

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An additional operator is required for a 2 shift system working under George 2. Salary on commencement will take account previous experience and is followed by a salary scheme of increments up to the maximum, granted on performance with further service and proficiency leading to the position of Senior Operator. Promotion later to the Shift Leader position is then dependent on proficiency and vacancies.

Both positions
The installation comprises an ICL 1902S with 3502 Card Reader, Tape, Train Printer, etc
The salaries quoted are inclusive of Special Duties Allowance, Addition to London Weighting of £525 p.a. Other benefits include 5 weeks generous holidays, superannuation scheme, season ticket loan, mortgage advances, subsidised staff restaurant and recreational facilities, relocation advances in approved cases.
Applications, including full details of education and relevant experience, or enquiries are invited and should be addressed to:

COMPUTER SERVICES MANAGER
GUILDHALL, LONDON EC2P 2EJ

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— Air fares and relocation expenses paid
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Interviews will be held in London in early March 1979.

INTERESTED? Call Ian Cox on 01-637 0105 or 278 6426 (day) or 01-272 2794 (evenings & weekends) or send full CV to: FREEPOST 26, ACS Ltd, 42-48 Great Portland Street, London W1N 5AH.

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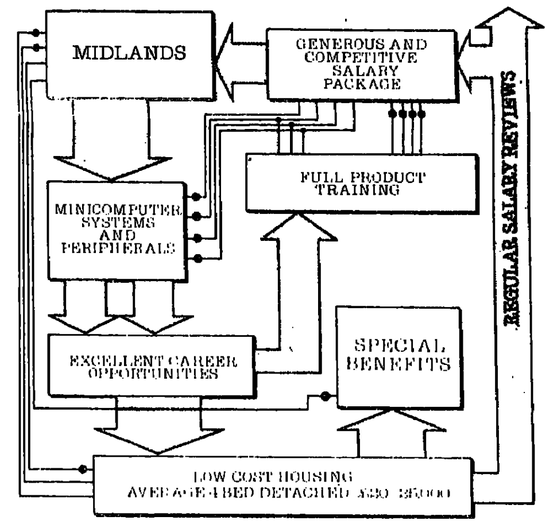

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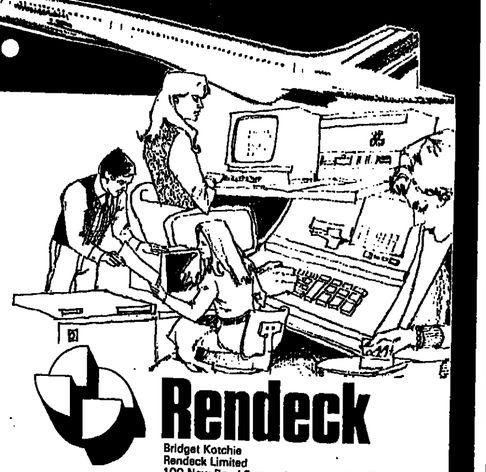

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Qualifications:
A degree or HNC in Computer ... Physics or Mathematics. ... (IIIS) should have at least ... post graduate experience to ... an Honours degree or for ... experience for those with HNC/HND.

Salary and Conditions:
The appointment will be ... Scientific Officer or Higher ... grade. Starting salary will ... age and experience but will ... the following scales:-

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Closing date for applications ...

NATURAL ENVIRONMENT RESEARCH COUNCIL

It's all happening in the Middle East

An exciting new development has occurred with the setting up of a PDP11 70 installation in the Middle East. The machine will operate under the IAS operating system software and will include the DBMS 11 database package.

The following personnel are needed urgently.

* Systems Programming Project Leader who can demonstrate a familiarity with IAS and DBMS 11.
* Systems Programmer.
* Senior Operator.
* Junior Operator.
* Data Entry Supervisor
* Data Entry Operator

The high rewards include a minimum contract for two years, free furnished housing with air conditioning, free holiday travel and the kind of tax-free salaries you would expect (£12,000 for the Project Leader for instance).

Please apply in the first instance to:
Programming & Systemsolve Limited
9-11, Talton Street, Knutsford,
Cheshire, WA16 6AB
Tel: 0565-4925
or
30, Baker Street,
London W1M 2DS

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All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring David Abbey for further details on 01-261 8016.

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As part of the CAP CPP Group's continuing expansion plans, a new company is being formed to service the military and scientific markets more effectively

Opportunities with CAP-CPP in the Scientific Field

If your background includes software related work in one or more of the areas listed below then we shall be pleased to hear from you.

Prototype development	Command and control
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At this stage we are probably interested in applicants with two or more years experience but there will be some appointments for staff with less experience later in the year.

ABOUT CAP

Computer Analysts and Programmers was established in 1962 and has been profitable in each of the sixteen years of its operation. The Group now employs over 800 professional staff. All staff take part in our well established career development programme and project performances are carefully monitored to ensure that individual skills and aptitudes are taken into consideration on future projects. Benefits include at least 4 weeks holiday, a generous sick pay scheme, group sickness insurance, staff mortgage service, a share purchase scheme and regular salary and promotion reviews. Senior staff are eligible for our annual bonus scheme. Removal assistance is available where appropriate. Local interviews will be arranged where applicable. If you would like to apply please write or telephone, quoting reference number CW.1176, to:-

Tony Knott, Recruitment Manager
Computer Analysts and Programmers (UK) Ltd., CAP House, 14/15 Great James Street, London WC1N 3DY.
Telephone No: 01-242 0021

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Address .....

.....(write)

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The Governing Body invites applications for the above vacant office.

The salary range (from 1 March, 1979) is: £7,221-£9,530 p.a.

Application forms and further details of the post may be obtained from the undersigned.

Latest date for receipt of applications is WEDNESDAY, 28 FEBRUARY, 1979.

M. F. Kelleher, Secretary.

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Ring David Abbey for further details on 01-261 8016.

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AP1/2

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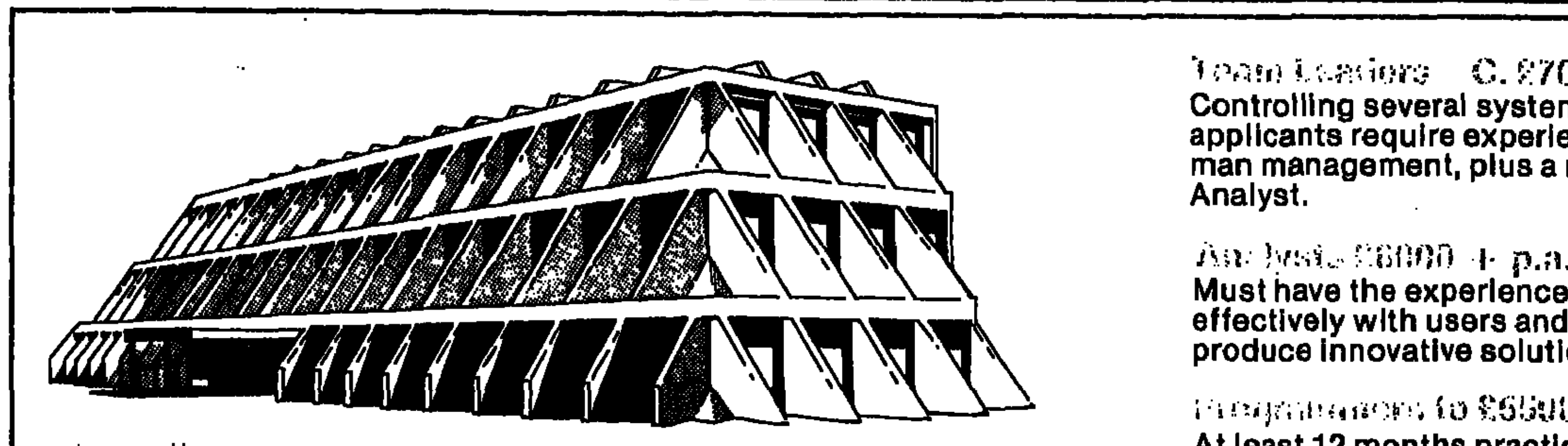

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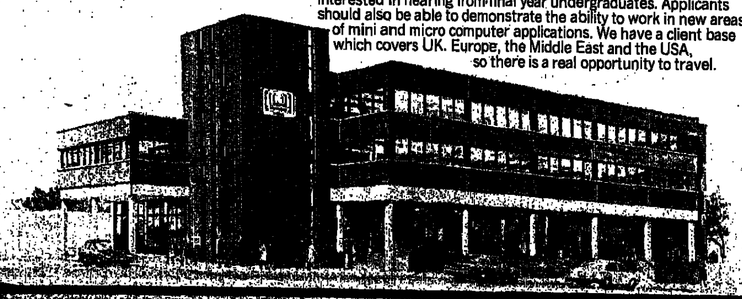

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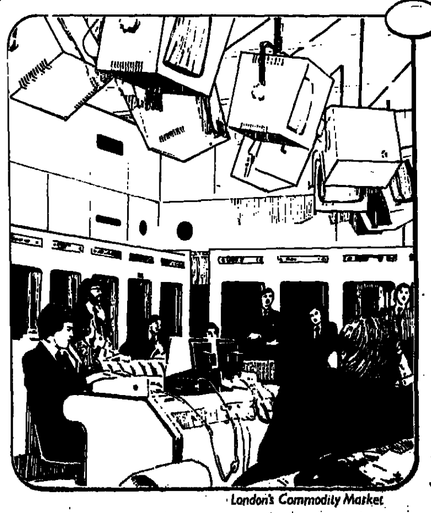

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Applications are invited from Honours Graduates who are interested in applying computing techniques to the processing and analysis of Government social, economic and financial statistics in the Central Economic Service, Department of Finance.

Vacancies exist at Deputy and Assistant levels. Candidates for both posts must have a good Honours Degree, preferably in statistics and computing, although candidates with good Honours degrees in other subjects may be considered.

At Deputy level applicants must have a minimum of 4 years' relevant post-graduate experience. It would be an advantage if this experience included some of the following: use of statistical packages, Fortran programming, on-line computing, data-base management.

The Commissioners may decide to interview only those applicants who appear from the information available to be best qualified.

Salary Scales:

Deputy	£5,701-£7,562
Assistant	£3,113-£4,842 (plus an allowance of £412 per annum after 2 years' satisfactory service within the maximum of the scale).

Grading and starting salary will be related to qualifications and experience.

Please write or telephone for an application form quoting job reference SB 116/79/CW to the Civil Service Commission, Rosepark House, Upper Newtownards Road, Belfast BT4 3NR (telephone Dundonald 4585 ext. 256). Completed forms must be returned to arrive not later than 1 March, 1979.

NORTHERN IRELAND CIVIL SERVICE

Systems Programmers — all levels

In order to develop our next generation of micro-computer based terminals we need innovative Programmers who are looking for an opportunity of applying their abilities to the design and development of complete systems.

Those abilities should include the capability of taking a product from initial concept through design and development into production.

Specifically, you will be involved on all of the following:

- ★ Operating Systems
- ★ Interpreters
- ★ User Interfaces
- ★ Maintenance and Diagnostic Routines

Previous experience in any of the above would be useful but not essential, enthusiasm, being the most important factor.

We are looking for Systems Programmers at all levels, from recent graduates to those with many years of experience who are looking for a new challenge.

Initially you will be based at Croydon although some travel will be necessary in order to fulfill your job responsibilities. Long term career opportunities exist both in the UK and overseas.

The compensation package will reflect the importance placed on these positions. Salary, in particular, will not inhibit selection of right persons.

Please write or call, Cliff Marks
Personnel Manager
Burroughs Machines Ltd.
512 Purley Way
Croydon, Surrey CR0 4NZ
Telephone 01-686 0355

Burroughs

FIELD SERVICE ENGINEERS

(DATA COMMUNICATIONS)

Cole Electronics Limited invite applications to join the team of field service engineers to maintain and service the rapidly expanding customer base of modems, multiplexors, and intelligent network processors.

A vacancy exists in the Basingstoke area for an applicant with experience of servicing in one or more of the following fields: Computers, computer peripheral equipment, data communications and digital transmission equipment. Qualifications required are HNC or C & G Final standard.

Generous salary with overtime, subsistence allowance and company car are offered, together with benefits including BUPA, non-contributory pension scheme and life assurance.

Please write or telephone Mrs. Deborah Ashworth an application form.

Cole Electronics Limited
105/107 Lansdowne Road
Croydon, Surrey, CR0 2BN
Telephone: 01-680 8507

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COMPUTER PROGRAMMERS — URGENT

CONTRACT WORK CENTRAL LONDON

BFC minimum in either MATHS, COMPUTER SCIENCE or ENGINEERING SCIENCE, applicants must have at least 1 (one) year minimum experience of FORTRAN 4 and experience of COBOL or basic languages. Rates to £4.20 per hour P.A.Y.E during the week midweek overtime paid at £6.60ph weekend at £6.30 & £8.40 P.A.Y.E. The minimum age for these contracts are 22 years old, immediate starts are available

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Required by a major international company in the West End, suitable training where applicable. Salaries will be in the range of £3,600 to £4,000 p.a. and will include 4 weeks' holiday per year, a subsidised canteen and the usual fringe benefits associated with a major company.
For further details of the above and other vacancies available please contact:

Mike Pemberthy or Ray Ryan
Kenway Technical Services (Southern) Ltd
1 Old Pye St
London SW1H DEZ or phone 01-222 3834
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Sales Manager

London — £10-12,000 + car

Coltec Data Systems design and manufacture computer-based typesetting equipment for the printing industry. It is about to build up its own sales force to replace its existing agents. The Sales Manager would be expected to achieve this.

The Sales Manager is a senior appointment in a small company and is expected to contribute to the management and policy making of the business, and to take responsibility for marketing and commercial aspects of the sales function. The job is primarily to sell computer-based systems to publishers and printers and the manager is expected to carry out sales visits personally. He/she must have a record of achievement in technical sales and, ideally, should have an understanding of modern mini computers and of the print industry. Base location is close to the City of London. Prospects are excellent, dependent primarily on the results achieved by the individual. Direct bonus is therefore not considered appropriate. Initial salary and conditions of work are fully negotiable but are expected to include a £10-12,000 salary and a car.

PA Personnel Services Ref: SM/9676/CW
Initial interviews are conducted by PA Consultants. No details are divulged to clients without prior permission. Please send brief career details or write for an application form, quoting the reference number on both your letter and envelope, and advise us if you have recently made any other applications to PA Personnel Services.

PA Personnel Services

Hyde Park House, 60a Knightsbridge, London SW1X 7LE. Tel: 01-245 6060 Telex: 27874

PA

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For the software portion of a major production contract for the Royal Navy.

Smiths Industries Limited (Aviation Division) have a vacancy for a software project engineer qualified to degree level in electrical/electronic engineering, mathematics or computing science.

The successful candidate must have had several years' experience in the design and development of real time software, preferably for military applications using a high level language, e.g. CORAL 66. Knowledge of navigation and navigation aids would be particularly useful.

Previous experience of the management of a small team is desirable, while the ability to handle a project from inception to production is considered essential.

One important aspect of the job is to liaise with the customer and with subsidiary companies within Smiths Industries Limited.

Phone or write for application form to:
H. Upson

SMITHS INDUSTRIES LIMITED
AVIATION DIVISION

Aviation Division, Bishops Cleeve,
Cheltenham, Glos. GL52 4SF
Tel: Bishops Cleeve 3333 Ext. 2369

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

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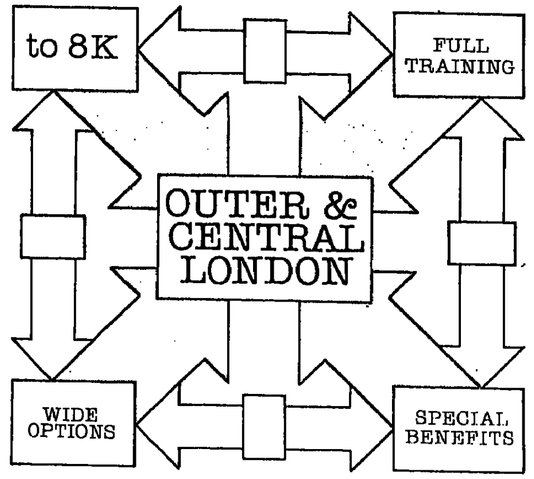
P.S. Opportunities also exist elsewhere in the U.K.!



Suite 201/6, Albany House, 324 Regent Street, London W1R 5AA 01 637 9611 **MANAGEMENT & EXECUTIVE SELECTION**

JBA

Turnkey (DEC) Systems Sales

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Our client is a young, fast growing company in the Turnkey systems business (among other activities), able to provide an unrivalled opportunity for a dynamic, hardworking individual to significantly contribute to the success of the organisation - and be well rewarded for doing so. A successful sales track-record is essential, together with the ability to recognise user problems and provide total solutions.
The Sales quota is £250K, which with Systems priced between £30K and £130K should not prove difficult to achieve. Earnings potential is therefore extremely high.
A company car is naturally provided and the successful candidate can look forward to a career leading to sales management. The chance to earn a stake in the company is also on offer.
Contact: Andy Wright

Systems Consultants

London — **neg. to £9,500 + benefits**

Several major development projects involving databases and teleprocessing networks are currently being developed by some of the most prestigious international organisations based in the UK. We therefore have several vacancies being notified to us and would like to hear from Analysts who possess a sound, broad commercial or business applications systems background on any type of machine.
Candidates should have already progressed through the usual channels (i.e. programming and low-level design) to their current positions and be looking for the opportunity to further broaden their experience, perhaps into areas of technology hitherto outside their scope.
Salaries at this level range from £7.5 to £10K and are generally negotiable according to ability.
Contact: Margaret Stevens

BELGIUM
Technical Authors (Software)

c. £15,000

Our client has vacancies for up to eight Technical Authors with at least 2 years experience of software product documentation, ideally non-commercial. Programmers with a flair for writing will also be considered, providing they can demonstrate a keen interest in this type of work - maybe as a career.
Some of the positions are relatively short term so that Authors not requiring a long period away from home could be interested.
Contact: Mike Creamer

(Junior) Systems Programmer

Surrey — **up to £7,000**

This organisation now have their IBM 3032 installed and running under VS1 with plans to introduce MVS within one year. This presents an ideal opportunity for a systems programmer, with around two years good IBM experience, to move onto the latest range of equipment and obtain valuable further training. Applicants should be familiar with performance orientated products and have a good understanding of SYSGEN and operating systems. The successful candidate will enjoy an environment or self-defined job responsibility and every encouragement to progress in their career.
Convenient location. Realistic salary, and excellent fringe benefits.
Contact: Mike Creamer

Analyst Programmer

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Applicants should have at least two years as a programmer in an insurance environment with experience of COBOL (or RPG2). A background of mini-computers would be an advantage.
This is a real opportunity to work in a small group with professionals and have the chance to travel.
Contact: Jim Baker

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All Areas — **to £6,000 + car & benefits**

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Excellent remuneration packages (c. £8,000), career prospects and work involvement.
Contact: Margaret Stevens

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

THE OPEN UNIVERSITY STUDENT COMPUTING SERVICE
COMPUTER OPERATOR

Applications are invited for the above post at The Open University Computer Centre, The Regent Centre, Gosforth. The Student Computing Service maintains a large national time-sharing network using Hewlett Packard 2000 and DEC-20 computer systems which provide a practical computing service to 30,000 students via remote terminals. Previous experience with time-sharing computer systems would be an advantage.

We would also be interested in applications from young persons who wish to commence a career in computer operations.

Salary, according to age and experience, will be within the range £2,676-£3,084 (under review). Two shift working will be required for which an allowance of £345 p.a. will be paid.

Application forms and further particulars are available from The Recruitment Office, (JD628/1), The Open University, P.O. Box 76, Walton Hall, Milton Keynes MK7 6AL or telephone Milton Keynes 63404, there is a 24-hour answering service on 63868.
Closing date for applications: 1st March.

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We can give you the responsibility for taking software systems all the way from initial discussions to final production on behalf of clients ranging from one-man businesses to multinational agencies.
If you are adaptable, versatile and self-motivated with a computer science or related degree, 3-5 years' industrial experience of using both high-level and assembler languages, 'hands-on' experience of microprocessors, and the ability and personality to be able to generate business contacts, then we are keen to hear from you.
We can offer an excellent salary and fringe benefits in pleasant working conditions in brand new purpose-built premises.

Please apply to: Janet Hales, Personnel Officer,
Cambridge Consultants Limited,
Science Park, Milton Road,
Cambridge. Tel: Cambridge 58866

FINANCE DEPARTMENT

COMPUTER PROGRAMMER

Post No. FC6

Salary Grade AP4/5 — £3933-£4761 + £312 weighting.
Commencing salary within the Career Grade will be dependent on qualifications and experience.

Applicants must have at least two years experience of IBM and COBOL Programming and a working knowledge of Applications Manager Software would be an advantage. The successful applicant will be expected to assist in designing, writing and maintaining Applications programs (some of which are On-Line), working as a senior member of a Team.

The Council are currently enhancing the hardware of their I.C.L. 1902T Computer to facilitate the introduction of communication systems.

Application forms available from and to be returned to the Chief Personnel Officer, Civic Centre, Wigan. Tel. Wigan 44991 Ext. 30.
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Would you like to work on the latest IBM 3030 machines? If you have good MVS experience and know JCL well, then this top grade Manufacturer and Service Bureau would like to see you. Tip-top perks and paid overtime. CW 7/9.

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To £4,000 Inc. NR. CITY

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Now is the chance to extend your nine months' minimum experience of IBM DOS/VS systems. Apply now and join the queue for this excellent vacancy. Only 2 shifts. CW 7/11

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This company is looking for Honeywell OS 2000 operators who would like to be trained to work on the latest H64 series machines. Only a two-shift system so you can sleep nights. CW 7/13.

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Hoskyns Systems Limited 91 Farringdon Road, London EC1M 3LB
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All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring David Abbey for further details on 01-261 8016.

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Letters of application quoting reference TT/24/BC giving a full curriculum vitae and names of two referees should be addressed to Dr P J Grigg, Department of Textile Technology, UMIST, P O Box 88, Manchester M60 1QD

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The successful applicant will be required to undertake reviews and reports on existing and proposed D.P. Systems. This includes liaison with both the User Section and Computer Staff prior to the implementation of all new financial programmes to ensure adequate controls are incorporated. You should have experience in computer programming and/or systems analysis. An Accountancy Qualification would be an advantage.
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Job Details and Application Forms available from the Personnel Officer, Municipal Buildings, Kirkby, Liverpool L32 1TX (051-548 6555)
Closing date 2nd March, 1979

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SERVOTEST

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Salary up to £6,555 p.a.

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JUNIOR PROGRAMMER
Salary up to £5,604 p.a.

This post would be suitable for someone seeking to establish a firm base for a career in computing, and appropriate training will be provided. It is envisaged that the post will be of limited tenure for 3 years.

For detailed information about the above vacancies and an application form, please write to the Registrar, University of Leicester, Leicester LE1 7RH. Informal enquiries may be directed to Roy Bent on (0533) 50000 Ext. 348. Completed applications should be returned as soon as possible and not later than 9th March, 1979.

DP Programming

Vacancies exist for experienced DP programmers (either male or female) in the Central Management Services Department of ICI. The department is located at Wilmslow in a pleasant part of Cheshire to the South of Manchester.

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The successful candidates will probably have been educated to 'A' level and will have at least 2 years' programming experience in PL1 under O.S. on commercial administrative applications. Knowledge of Mark IV would be an added advantage.

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Starting remuneration within the range (a) £4500 – £5500 and (b) £5000 – £6000 will depend on relevant experience, and opportunities for promotion are good. The Company operates profit sharing and contributory pension schemes, and help can be given with costs of removal.

For an application form phone Alderley Edge 582828 Extension 5238 or write to:

Mr S D Kemp,
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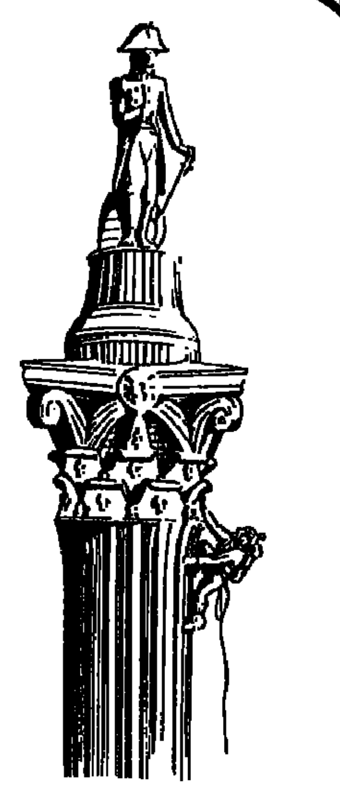

PROJECT TEAM LEADER Sth London/Beckenham c £7,500
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Our client is closely linked with the London Stock Exchange and provides specialist systems for approximately 200 companies. The Project Leader should be a trained systems analyst with a sound programming background, preferably on ICL equipment. He will be expected to lead a project team of analysts and programmers in the development of various financial systems. Previous experience of producing systems proposals, program specifications and user guides is essential.
Our client also requires Trainee Systems Analysts. Applicants should be competent programmers who possess the ability to express their ideas clearly in writing. Formal systems training will be provided.
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Salary will be negotiable at £6,000+ and fringe benefits will include a company car, private medical insurance etc.

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Greenford UB6 9BW
01-578 4563

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If you are interested, please send your complete resume to our Personnel Department on the following address:

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Telephone: 013 - 67 39 73.

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AMS

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DJB180178.

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THE SALES AND MARKETING BIT

FORECASTING—III

Unpredictable influences afoot

LAST week we discussed the generation of the basic sales forecast by way of existing revenue, known prospects and income from as yet unknown sources which might be billed during that same forecast year. Then, conditioning these figures by internal factors such as production capacity, financial implications and the availability of personnel.

Unfortunately there are other, less predictable influences afoot which must also be taken into account.

EXTERNAL FACTORS
Economic

It would be foolish to overlook the profound effect that fluctuations within the national and international economies can have upon company revenue whether in the equipment or services sector.

Those who were in the computer industry during 1971, for instance, will recall how, in a matter of weeks, business virtually dried up for suppliers of all kinds.

It is impossible to anticipate precisely such situations, but the sales forecast needs to be influenced by the more positive features of economic forecasts.

People like the Department of Trade and Industry regularly produce reports covering a wide range of industries (and countries!) which discuss trends, investment programmes and forecasts of economic growth or decline.

Bankers' forecasts can also be obtained with emphasis on specific industries and markets, discussing current investment trends, technological development, and so on.

There are many other sources of input on this subject which can give the sales and marketing manager (not necessarily one person!) a comprehensive and essential picture of the national and/or international scene from a political, economical, legislative and technological point of view.

One situation which can have a profound effect on the sales budget is the devaluation of currency, particularly if one is working for a parent company which is based overseas and insists on sales budgets being in its own currency.

When sterling is depreciating against other international currencies, particularly the dollar, there tends to be a distinct lack of interest on the part of corporate headquarters in modifying existing business plans. However, the reluctance to amend dollar oriented sales budgets has not been so apparent of late.

Political

It is difficult to separate economics from politics these days, and certainly it takes a brave (or inadequate) sales manager to ignore the antics of Whitehall and the unions.

The kind of reports we have already discussed typically have a significant political content, and from a business point of view it really doesn't matter whether a market is likely to dry up due to union problems or the price of coconut-oil.

However, the kind of politics which tend to affect the salesman and therefore the sales forecast is the political closed shop where, due to political edict "We only buy British" or "Head office policy, we are committed to IBM", sales success may not be as easily achieved as elsewhere. No sales forecast can afford to ignore the inertia of political reluctance.

Competitive campaigns

The possible launch of new products by competitors cannot go unheeded either, for they can have a profound effect on sales achievement. A large technical advancement or a significant price cut can stop the salesman dead in his tracks.

This is seldom a permanent situation, but the revenue lost while an opposing strategy is created can be very significant.

One would have to employ the combined forces of the CIA, KGB and James Bond to discover the precise marketing plans of every major competitor in the computer industry. However, in the UK, we do have the doubtful advantage of having most new computer products launched and tested in the US before they arrive on our shores. This leads to reports on sales and technological performance in US journals which are freely available for UK readership.

Market fluctuations

These influences are generally of two types: industry trend and national habit.

If part of a product range is industry oriented then there is always a chance that it is affected by the fluctuations which are inherent to that business. For instance, travel, retailing, farming, Christmas puddings.

Then there are those times of the year when to all intents and purposes the country grinds to a halt, thus having a significant effect on labour intensive industries.

For example, August and the Christmas/New Year break, which typically makes for a two-week month.

One can only ignore all those other artificial lulls which are a good excuse for inactivity. "Sorry, we haven't been able to make a decision on your proposal yet. Shrove Tuesday has really created havoc for us this year."

Next week will be the final item on the topic of sales forecasting.

TRADER

Puzzle Answer

The error in question is turning a reversible set of digits "inside out" i.e. 3(2)8(1)7 "transposed" to 3(1)2(7) gives a difference of 3,840, which equals 81 x 40.

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Software Project Leader Multi Tasking-Real Time/Minis Micros	£8000	**Herts** Ref. M2909
Technical Consultants Process Control. Machine Control	£7500	**Herts** Ref. L2908
Senior Systems Programmer COBOL/ASSEMBLER	£6300	**Kent** Ref. M2755
Senior Programmer 4 to 5 years' COBOL	£7000	**Herts** Ref. L2821
Senior Project Leader COBOL & Communications exp.	£6000	**Cambs** Ref. M2826
Systems Analyst Commercial Business/Systems	£8500	**W. London** Ref. M2810
Systems Analyst 5 years' COBOL/Commercial	£6500 + car	**Middx** Ref. L2740
Programmer COBOL (Travel Co.)	£5500	**Herts** Ref. B2945
Programmer OS COBOL	£5000 + car	**Middx** Ref. B4921
Programmer Mini Assembler	£7000	**N. London** Ref. B2852
Analyst/Programmer COBOL-CORAL	£7000	**Leeds** Ref. B2856
Systems Programme Mini Software/Assembler	£8000 + car	**Bucks** Ref. C2850
Programmer COBOL/ALGOL	£7000	**E. Anglia** Ref. C2854
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ICL Operators/Shift Leaders VMEB	**South London** Ref. 303
IBM Operators OS VS1	**Middlesex** Ref. 346
ICL Operators System 4 J17/1800	**Middlesex** Ref. 293
ICL Technical Support 2903/2904	**North London** Ref. 215
ICL Operators System 4 J17/1800	**Essex** Ref. 351
ICL Operators GII(GII+	**North East** Ref. 318
IBM Operators System 3	**C. London** Ref. 268
ICL Operators GII	**North London** Ref. 347
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Senior Operator GIII/VME	c £5000	**Middx** Ref. M2840
Operator 2903 JCL 2 years' max	c £4300	**C. London** Ref. M2920
Data Control Supervisor ICL 1900/2900	£4500	**S. W. London** Ref. L2845
1900 Operators GII/GIII	£4500-£5500	**London/H. Couns** Ref. M0201
Burroughs Operators All Levels	£4500+	**All Areas** Ref. L0243
Senior Operator Exec 8	c £4800	**Bucks** Ref. B2833
Senior Operator System 3 days only	c £4100	**N. Surrey** Ref. B2917
Operator H OS 2000 2 shift	£4300+	**Kent** Ref. B2914
Senior Operator J 1800 2 shift	£5000	**C. London** Ref. B2913
Operator System 3 2 shift	c £4400	**N. London** Ref. B2879
Senior Operator GCOS	to £5000	**Surrey** Ref B2859
Shift Leader OS/VS1 2 shift	to £5800	**Middx** Ref. B2886
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Applications quoting the relevant vacancy number, giving full details should be forwarded to the Personnel Officer (Recruitment), Central Electricity Generating Board, Bankside House, Sumner Street, London SE1 to arrive by **26 February 1979** or telephone Dave Norris on 01-261 [illegible]

South Eastern Region

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